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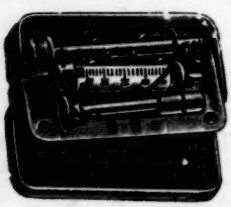

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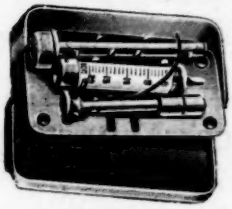

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An Address
ON THE
INFLUENCE OF LIGHT IN PREVENTION AND CURE OF RICKETS.

Read before the Royal Society of Medicine, London, July 7th, 1922,

BY ALFRED F. HESS, M.D. NEW YORK,
CLINICAL PROFESSOR OF PEDIATRICS, UNIVERSITY OF NEW YORK.

UNTIL recently active interest in rickets had lapsed, in spite of the fact that it was recognised as the most widespread nutritional disorder of infants occurring in the temperate zones. In the latter half of the past century there was at times intense investigation of its pathology, associated with the names of Virchow, Pommer, Kassowitz, Schmorl, and others, but in general it has been regarded as a troublesome but most uninteresting disease. To-day it is a centre of interest, not only for the children's specialist, but for many biologists, chemists, physiologists, and other medical scientists. This is due, in part, to increased interest in nutritional disorders, or rather, disorders of nutrition, brought about by a realisation of their importance; but principally it has been the result of the experimental production of rickets in animals—an illustration of the great value of experimental medicine, of the rapid advance in knowledge which immediately follows the ability to produce a pathological condition at will and to control the various factors associated with it. In this connexion Mellanby, Paton, and Findlay deserve the greatest credit, for they were the first to attempt, by means of a series of carefully planned experiments with dogs, to ascertain the dietary constituents involved in the ætiology of rickets. Previous experimental work of this kind had been spasmodic and desultory. In the United States Sherman and Pappenheimer, as well as McCollum, Park, and their associates, have devised diets which can be depended upon to bring about rickets in rats, to induce lesions which are the counterpart of the lesions noted in the epiphyses of infants.

It would lead too far afield to attempt a discussion of the rôle of diet in the ætiology of rickets, but it is hardly possible to avoid altogether this aspect of the subject. That diet plays a rôle in this disorder is obvious from the fact that breast-fed infants all over the world develop rickets less frequently than do bottle-fed infants. But this does not imply that faulty diet is the dominating factor in the ætiology, nor that its incidence depends upon the adequacy in the diet of the fat-soluble vitamin. For example, it is by no means uncommon to find those infants develop rickets who receive a very large amount of milk, whereas others receiving less fail to show signs of this disorder. It seems quite possible that some of the existing confusion has arisen through the interpretation of the pathologic lesions. On depriving rats of the fat-soluble vitamin, in a dietary otherwise complete, osteoporosis, rather than rickets, results. Is it not possible that in some instances osteoporosis has been confused with rickets? Strange as it may seem, the entire question of the precise definition of rickets has become more difficult rather than more simple as the result of our recent access of knowledge. To-day we are beginning to doubt which lesions should be included in the category of rickets and which should be excluded. Clinically the same difficulty has arisen. Are beading of the ribs, craniotabes, bowing of the legs, always characteristic of rickets, or may they have other significance? Radiographs offer the same difficulty, and must be regarded in many instances as a subjective rather than an objective sign. The same is true of chemical examination of the blood. Is a diminished content of the inorganic phosphate of the blood to be regarded as pathognomonic of rickets or merely as corroborative evidence in favour of the diagnosis?

SEASONAL CHARACTER OF RICKETS.

The essential seasonal character of rickets has been known for years, and is one of the most striking features of this disorder. Throughout the winter infants gradually show signs of the disorder, the flood-tide being reached at the end of March. Under ordinary circumstances cases do not develop in May or during the summer. One-quarter of the cases, in our experience, develop in the second half of the year, and three-quarters in the first half of the calendar year. It seemed to Dr. Unger and myself some years ago as if this phenomenon held the crux of the question. In order to investigate its nature, and prevent the regular occurrence of rickets in the winter, we gave a series of infants, throughout the season, dried milk prepared from milk secreted by pasture-fed cows. This milk was dried by the roller process and was rich in fat-soluble vitamin. Without entering into the details of this study, which has been reported elsewhere,[3] it may be stated that about as many infants developed rickets on this milk as on the commercial milk of the same brand from cows fed with ordinary winter fodder.

In order to test another aspect of the seasonal factor we attempted to cure a certain number of rachitic infants by means of exposing them to the rays of the mercury-vapour lamp. Our results were inconclusive, as the Rontgen rays were not at that time available for observing the calcification of the epiphyses. Huldschinsky,[4] who also used this source of radiation, noted definite healing by means of radiographs. The same effect can be brought about by daily short exposures to the sun's rays. If infants are placed in the sunlight for about one half-hour daily, so that the rays impinge directly on their skin, the rachitic lesions of the epiphyses will rapidly undergo calcification. This treatment can be carried out in winter if the infants are properly clothed and care is taken to avoid access of strong wind. It is evident, therefore, that the seasonal incidence of rickets is controlled by a variation not of diet, but of climate, and especially of sunlight.

INTER-RELATION OF RADIATION AND RACHITIC DIET.

These studies can be checked by experiments on rats. As stated, a diet can be so constituted as to produce rickets invariably; the diet commonly used for the purpose is adequate in calcium, but low in phosphorus. If the phosphorus is increased in this dietary so that it contains about 150 mg. of phosphorus instead of only about 85 mg. per 100 g. of diet, then it is changed to a non-rachitic diet, and never leads to the development of rickets. It was shown by Hess, Unger, and Pappenheimer,[5] as well as by Powers, Park, Shipley, McCollum, and Simmonds,[6] that if rats are exposed to the sun they fail to develop rickets on the standard rickets-producing diets. In other words, the sunlight is approximately equivalent to doubling the intake of phosphorus in this dietary.

The same result can be brought about by using artificial sources of light. The mercury-vapour quartz lamp may be used. It will be found that white rats, fed on the standard diet, will be regularly protected from rickets by daily irradiation at a distance of three feet for a period of three minutes. This may be considered as the unit of protective radiation. The carbon arc lamp has also been used both in animals and in infants.[7] It was resorted to because its spectrum more nearly resembles that of sunlight, having a band rather than a line spectrum, and emitting less of the short ultra-violet rays than the mercury-vapour lamp. These short rays are especially irritating to the skin. It was found that with this lamp, using 30 ampères, rats could be protected by exposures of four minutes daily at a distance of three feet. An ordinary lamp with white flame carbon was used, such as is commonly employed in taking motion pictures. Radiations from this lamp were found of distinct service in treating rachitic infants, especially as there was no tendency whatsoever to cause excoriation of the skin. Either an individual rachitic infant was treated daily for

30 minutes at three-feet distance, or a group were exposed at a distance of about nine feet for a period of an hour. Within two weeks calcification of the epiphyses could often be noted; this was always marked after a month's treatment. In view of the importance which has been attributed to pigmentation of the skin in heliotherapy, it is of interest to observe that this form of radiation does not bring this pigmentation about.

The question of the ætiological importance of light cannot be considered by itself, but must be surveyed in relation to reciprocal factors, of which the most important are diet, rate of growth, and pigmentation of the skin. This aspect has been considered in a recent survey of the subject,[8] and will, therefore, only be touched upon in the present discussion. Experiments on rats demonstrate that if the diet is markedly productive of rickets long exposures to light are necessary to afford protection, whereas if the diet is less inadequate short exposures suffice. Various gradations of these two factors can be formulated at will. The same is true in relation to growth. Numerous animal experiments could be cited to illustrate this point. For example: On the standard diet, a standard degree of light-raying of four minutes daily with the carbon arc at a distance of 3 feet will invariably protect against rickets. On this diet rats grow poorly. When it is amplified so as to lead to progressive and moderate growth the same degree of irradiation will fail to protect. This phenomenon, translated into terms of clinical medicine, signifies that the atrophic or marasmic infant—notably unsusceptible to rickets—has, in relation to this disorder, a far smaller requirement of active light rays than the rapidly growing normal infant. Three-quarters of the infants developing clinical rickets in our institution have been thriving well, whereas only one-quarter developed the disease while making small gains. This is one explanation, as can be shown by animal experiment, of the "spontaneous cures" which occur in infants during the second year of life when the growth impulse is less intense. A third factor affecting the potency of light is the intensity of pigmentation of the skin. This aspect likewise can be demonstrated by a simple experiment. If two groups of rats (the melanotic form of the Norway rat) are given the minimal protective dose of light, it will be found that although diet and rate of growth have been the same, the black rats will develop rickets, whereas the white rats will show no rachitic lesions. A table reproduces the results of rontgenograms and gross and microscopic examinations of two groups of rats subjected to a test of this kind. It is manifest that the protective rays were rendered inert by the pigment of the integument and the fur. This experiment has evident applicability to the well-recognised susceptibility of negro infants to rickets, and may be interpreted as indicating that negro infants require a greater degree of the effective light rays than do white infants.

There can be no question but that the protection is to be ascribed to the light waves. Could the effect be accomplished only in the sunlight, the action of the air, perhaps by cooling the skin, might be regarded as the potent factor; but since a quicker result can be brought about by artificial sources of light in small, poorly ventilated rooms, the rôle of the atmosphere can be disregarded in this connexion. Nor can the physiological effect be attributed to temperature. I have carried out a series of tests where rats of similar weights, fed on a similar diet, were kept at temperatures averaging 28°, 23°, and 18° C. while they were irradiated. This was accomplished by means of placing the cages over ice. The same degree of exposure was given and the same amount of protection accomplished quite independent of the temperature maintained.

WAVE-LENGTHS OF PROTECTIVE LIGHT.

The next inquiry was as to the wave-lengths of the light which possess this remarkable biological power. To this end a series of experiments were carried out using the mercury vapour quartz lamp and various glass filters which were known to exclude waves of definite lengths. But before discussing these experiments it may be well to say a few words concerning the activity of the sun. Except for the absorption indicated by the Fraunhofer lines, its spectrum is continuous, ranging from the long infra-red to short waves about 290 μ in length. These waves vary in length according to the season, to the time of the day, and largely according to the absorption of the atmosphere, but in general it may be stated that 290 μ is the limit of the ultra-violet waves. As stated, sunlight will prevent rickets in infants and in animals; its dosage cannot be accurately measured on account of the unreliability of weather conditions. When a plate of ordinary flint window glass, 5 mm. in thickness, was interposed between the sun and the experimental animals it was found that almost no protection was afforded. The potent rays had been filtered out. This explains an experience encountered some years ago, when, to my surprise, rickets developed in some infants who were excellently cared for in glass cubicles under the best of hygienic conditions. It also teaches the futility of attempting heliotherapy in rickets—and probably in tuberculosis too, according to the experience of Rollier—in rooms or porches enclosed in glass.

ANALYSIS OF RAYS.

An analysis of rays can be carried out by means of filters which have been carefully tested in relation to a source of light which can be controlled. For this purpose we used standardised glass filters* with the mercury vapour quartz lamp (56 volts). This lamp has a discontinuous spectrum, emitting a number of bright lines from 595 μ to about 230 μ, below which there are a number of weak lines. It will be noted, therefore, that the spectrum differs from sunlight in being discontinuous, and in its range of radiation which extends less far in the visible field but considerably further in the field of the ultra-violet. I shall not weary you with a detailed discussion of these experiments, but shall attempt to summarise them briefly. It should be borne in mind that with this source of light, and on the standard diet, rats can invariably be protected from rickets by daily exposures of three minutes at a distance of 3 feet. When a filter was employed which cut off all the rays shorter than 475 μ rickets invariably developed notwithstanding intense radiation. The same was true when a window glass filter (2·6 mm. in thickness) was employed; this filter allowed the passage of ultra-violet rays only as short as 334 μ. It was evident, therefore, that the potent radiations were ultra violet and that they were of shorter length than this. A filter allowing the passage of rays 313 μ in length (and a very small percentage of 302 μ) failed with 30 minutes of radiation, and gave incomplete protection when 320 protective units were employed. A similar filter proved of little value when this marked intensity of radiation was resorted to. When pyrex glass (0·8 mm.) was used, which allows the passage of ultra-violet rays as short as 289 μ, and even somewhat less, moderate protection was afforded with even 8 units of radiation, and complete protection with a few units more.

From this series of experiments the deduction is warranted that the protective rays are in the ultra-violet zone and are about 300 μ in length or shorter. It will be remembered that the sun's rays extend down to about 290 μ. In considering the question of radiation, intensity plays an important part, as well as quality of rays; failure may result when a filter 4 mm. in thickness is used, but protection may be given with a similar filter of half the thickness. This factor has been calculated in judging the results, and will be discussed in detail when the data of these experiments are presented in extenso.

* Such filters were kindly supplied by the Corning Glass Co., of Corning, N.Y. Most of these have been tested by the U.S. Bureau of Standards and are described in their technical bulletins.

FILTERING POWER OF WEARING APPAREL.

In order to ascertain whether it was necessary for the rays to impinge directly on the skin, some tests were carried out employing as filters cotton and woollen goods of various mesh, using the carbon arc lamp as the source of radiation. It was found that if this cotton fabric was interposed animals could be protected by three units of radiation, whereas if the material was somewhat heavier only slight protection could be accomplished with this intensity. White material permitted the passage of rays to a degree greater than black material manufactured by the same looms. Cotton and woollen stocking material, such as is commonly worn by infants, permitted but a small degree of the ultra-violet light to permeate unless very large dosage was employed. These experiments may be summarised by the statement that radiations must not necessarily impinge directly on the surface of the skin, but that there is—as might be expected—a quantitative relationship between the texture of ordinary wearing apparel and the degree to which it is pervious to the effective light rays.

EXPERIMENT WITH RONTGEN RAYS.

Before leaving the consideration of the action of light rays, it may be of interest to refer to a series of experiments in which Rontgen rays were employed. An attempt was made to protect rats from rickets by means of the soft rays of a Coolidge tube. The distance varied from 8 to 36 inches, and the period of exposure from 8 to 2 minutes. A ¾-inch spark gap and 15 milliampères current were used. All the animals developed rickets in spite of this radiation. Having failed to protect rats by this means, a series of animals were subjected to very large doses of the Rontgen rays to ascertain whether rickets could be induced in this way in rats fed on a non-rickets producing diet. The tube was placed 8 inches distant, with 3 mm. of aluminium as a filter, a spark gap of 6 inches and 5 milliampères of current, with exposures of 3 and 6 minutes. In no instance did rickets develop, merely the osteoporosis which regularly comes about in animals on this diet. This experiment gains interest, however, from the fact that a marked anæmia—a low hæmoglobin and red cell count—was brought about, and a definite leucopenia. These massive doses of radiation were found to have induced an extreme exhaustion of the marrow and replacement of the marrow elements with œdematous fatty tissue and cells resembling pale fibroblasts. This result constitutes an argument against the hypothesis, suggested by Marfan and others, that a dysfunction of the marrow is an important pathogenetic factor in rickets.

BLOOD CHANGES INDUCED BY HELIOTHERAPY.

Although we do not understand the mode of action of the ultra-violet light, it has been found that a chemical change, which may be significant, takes place in the blood in the course of heliotherapy. As you know, Howland and Kramer [9] found that the inorganic phosphate of the blood is almost regularly decreased during active rickets. In the course of treating rachitic infants with sunlight Miss Gutman and I found that accompanying the calcification of the epiphyses there was an almost constant rise of the inorganic phosphate to the normal level.[10] More recently this same return to the normal has been found to accompany the healing brought about by carbon arc irradiation.[7] This increase was noted in a series of cases where the blood phosphate had failed to respond favourably to daily doses of 2 g. of the secondary potassium phosphate. It may be added that in the form of rickets where the calcium of the blood is decreased radiation with rays from this source has brought back the calcium to its normal level. These effects are similar to those which follow the specific treatment with cod-liver oil. They are of interest in establishing a chemical basis for the employment of heliotherapy in rickets and definite evidence of metabolic change in the animal body brought about by the solar rays.

During the past year an analysis of the blood for inorganic phosphate has constituted one of the routine examinations carried out every month to ascertain the early occurrence of rickets. About 50 infants, varying in age from 6 to 18 months, have been followed in this way throughout the winter and spring. Last summer the average inorganic phosphate content was 4·35 mg. per 100 c.cm. of blood. In December, although the diet was unchanged and the hygienic surroundings the same, the percentage had fallen to 3·92 mg. It decreased steadily during January, February, and March. In April, especially in the latter half, it began to rise, with a further increase in May and a marked increase in June, which brought it to the level of 4·20 mg. per cent. These surveys represent some 300 individual tests.[11] This *seasonal tide of the blood phosphate*, the ebb in the winter, and steady rise to the flood of summer time, is to be attributed mainly to the seasonal variation of sunlight. It would seem that the ultra-violet rays are necessary for the normal metabolism of the growing infant, especially in relation to its exchange of inorganic salts. As stated, this tide occurred irrespective of diet, whether the infant received raw fluid milk or dried milk. It does not seem to occur regularly in adults, and was found to a less marked degree in older infants, in those ranging from 1½ to 2½ years of age—a period when the growth impulse has become less intense. There are, as far as I am aware, no comparable observations of an alteration in the chemical constitution of the human body varying from season to season. Some years ago Seidell and Fenger [12] reported a marked seasonal variation in the percentage of iodine in the thyroid glands of sheep, beeves, and hogs. In general, about three times as much iodine was present in these glands between June and November as between December and May. It is too early to discuss the significance of this observation in infants. This deficiency of phosphate must exert an important influence not only on the nutrition of osseous tissue but on other tissues of the body. It is quite possible that, secondarily, it may play a rôle in the immunity or susceptibility to infection, and be a factor in the striking seasonal variation of infections.

CONCLUSION.

It is impossible to appraise with any degree of accuracy the rôle of light in the incidence of rickets. This cannot be done until we know the nature of the dietetic deficiency or errors, and are able to view this aspect from a quantitative standpoint. The fact that the ideal diet, breast milk, fails to protect against rickets indicates that diet alone is not the dominant or controlling ætiological element. In my experience one-half of the breast-fed infants of the poor of a large city show some signs of rickets by the end of March—the peak of the rickets season. This holds true only provided this seasonal time is observed, and if careful clinical as well as radiographic examinations are carried out. It occurs in babies whose mothers are well nourished and have a liberal and varied diet. The conclusion must be that breast milk, although valuable, is provided with but a scant factor of safety against rickets, and that an additional protective influence is needed—namely, light. In London and New York the diet of the babies—the milk—is far more adequate and normal than the supply of light. It is a lack of sunlight which, in my opinion, brought forth the epidemic of rickets in the large cities of England which led to Glisson's classic investigation in the seventeenth century.

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A Lecture

ON THE VALUE OF

RESPIRATORY EXERCISES.

Delivered at the Hospital for Sick Children, Great Ormond-street, London, March 31st, 1922,

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INTRODUCTION.

So much has been written about the physiology of normal and abnormal respiration, and about the anatomical movements during inspiration and expiration, that any attempt to give a complete survey of the work done would be quite impossible as an introduction to a lecture. It is important, however, that respiratory exercises should be prescribed with a proper understanding of the physiology and anatomy of the act of breathing, and with an appreciation of those parts of the act not functioning adequately. I propose, therefore, to give you as briefly as possible my conception of the broad facts of the process. Much, also, has been written about the effects of respiratory exercises, and I recognise that when I come to treat of these I may tread on contentious ground, particularly as the various advocated systems have each their keen adherents and opponents. I propose, however, neither to dogmatise as to the physiological or anatomical processes of breathing, nor to champion any one system, but rather to investigate how apparently opposed theories may be in reality in harmony; and how different respiratory exercises may be of value in the various conditions of respiratory inefficiency.

Anatomical Movements.

These may be considered under three heads: (*a*) diaphragmatic movements; (*b*) rib movements; (*c*) lung movements.

(*a*) *Diaphragmatic Movements.*—These consist of two phases taking place in coördination in normal subjects. The anterior portion contracts first and rapidly, making, as seen on the X ray screen, a small flattened plateau on the dome rather than a uniform change in the contour. The crura then draw the whole diaphragm down, both central tendon and domes; and since the latter are in active contraction, a definite downward movement of the abdominal viscera occurs and can be clearly seen and shown on the orthodiagraph.

(*b*) *Rib Movements.*—It is not sufficient to consider the action of the ribs during inspiration as being simple movements whereby the lateral diameter and the antero-posterior diameter of the thorax are increased. It is so complex a movement that, as Keith[1] points out, part of the rib actually descends during inspiration; while the two diameters do not enlarge simultaneously, Keith describes thoracic movements as consisting of three parts: (*a*) the first rib and manubrium sterni; (*b*) an upper rib series confined to the second to fifth ribs; and (*c*) a lower rib series belonging to the sixth to tenth ribs. Space does not permit following his reasoning for this classification. In my opinion, however, the recognition of these three divisions is most helpful to a true understanding of the respiratory act. As regards the controversy that has raged round the question of the action of the external and internal intercostals—if the divisions of Keith are kept in mind, a simple conception of the movement of the ribs during quiet, deeper, and forced respiration can be reached without being called upon to take sides as to the specific rôles of the muscles involved in the movement of the ribs.

[1] Arthur Keith: Why does Phthisis attack the Apex of the Lung?, London Hosp. Gazette, Oct. 29th, 1903.

The average normal respiratory movement of the thorax is a sequence of events occurring in the following order. At the beginning of inspiration, the first rib and manubrium sterni are more or less fixed and act as a fulcrum for the second to fifth or upper series to move upon. The antero-posterior diameter of that portion corresponding to the upper series increases first, and is followed by an increase of the lateral diameter of the thorax. Immediately after the first part of this double movement, and before the second has really commenced, the sixth to tenth ribs commence their movement, but this time the lateral expansion of the thorax precedes the antero-posterior enlargement. Finally, as respiration becomes deeper, the first rib and manubrium become slightly drawn upwards.

Here I desire to emphasise two points in particular. First, the sequence of rib movements is largely individual and may, and does, vary somewhat widely in the normal subject; secondly, the respiratory muscles are in use during inspiration and the inspiratory during expiration—that is, respiration is a finely-balanced muscular act. The movement of the ribs is, therefore, an undulatory act, consisting of two waves partially out of phase with each other. It should also not be forgotten that, at any rate, in deeper respiration, as pointed out by Arbuthnot Lane,[2] Halls Dally,[3] and others, there is a definite extension of the dorsal spine which appears also to have an undulatory character from below upwards. When respiration is less deep the iliocostalis and longissimus dorsi portions of the erector spinæ continue to take an active part in both inspiration and expiration, as by acting "statically" or in "balance" they can provide a holding point for the intercostals to act upon. In this state the axis of the hinge movement of the ribs is between the angle and the head, the rib at the costo-transverse joint moving down during inspiration.

It seems to me probable that in the act of inspiration and expiration it is necessary also to take into account Sherrington's[4] work upon the two distinctive characteristics of skeletal muscles—namely, static and kinetic power. By realising the effect of these properties, it becomes easier to understand how one set of ribs may obtain from another the necessary fixed points for their own movement, and then themselves become fixed.

(*c*) *Lung Movements.*—During the downward plunge of the diaphragm the lungs move down, and this movement includes a downward movement of their roots. A movement of this kind naturally puts a considerable pull on the whole tissue in a longitudinal direction, and is particularly effective in expanding those infundibula enclosed in a cone whose base is the diaphragm, and whose apex is the apex of the lung. As Keith and Flack[5] point out the lung is of varying extensibility, and owing to this property the organ expands in the manner of a Japanese fan. It is also a delicate structure, and without an undulatory arrangement the infundibula would be easily impaired. Another zone of expansion coincides with that part of the thorax which we have seen above is the first to initiate rib movement, and is chiefly concerned with the expansion of the upper lobe of the lungs.

To sum up, the anatomical movements concerned in inspiration are: (1) a flattening of the cupolæ of the diaphragm followed by a downward and forward movement of the diaphragm as a whole; (2) during the first part of this movement, when the lower ribs are required to be more or less immobile, the upper set of ribs commence their movement which, when well initiated, is followed by (3) the movement of the lower set of ribs (this last being a necessary adjunct if the tone of the costo-sternal portion of the diaphragm is to be maintained as the central tendon descends).

[2] Arbuthnot Lane: Clin. Jour., 1896; Brit. Med. Jour., Sept. 6th, 1902; THE LANCET, Dec. 24th, 1921, p. 1317.
[3] Halls Dally: The Mechanism of Respiration from the Orthodiagraphic Standpoint, Proc. Roy. Soc., 1908.
[4] C. S. Sherrington: Postural Activity of Nerve and Muscle, Brain, November, 1915, vol. xxxviii., p. 191.
[5] Martin Flack: Milroy Lectures, 1921.

During both expiration and inspiration the spinal muscles play an active part, working upon what we may call the posterior hinge of the ribs.

SOME PHYSIOLOGICAL EFFECTS DURING RESPIRATION.

Physiological effects of the respiratory act may be divided into three: (1) Effects on the volume of blood supplied to the heart; (2) the gaseous exchanges occurring in the lungs; and (3) reflex and other effects.

1. *Effects on the Volume of Blood Supplied to the Heart.*—An increased volume of blood is brought to the right heart during each inspiration because: (*a*) The negative pressure in the thorax increases during inspiration, and (*b*) the positive pressure in the abdomen increases also during this period.

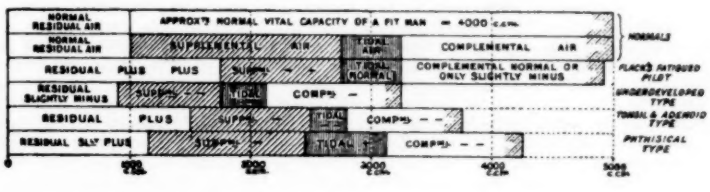
The descent of the diaphragm presses both upon the liver and the portal venous system, thus tending to press blood towards the right side of the heart. It has been clearly demonstrated by physiologists that the volume output of the heart per beat increases in direct relation to the supply of blood to the right heart.

2. *The Gaseous Exchanges Occurring in the Lungs.*—I do not propose to discuss the physiological processes by which oxygen is taken in by, and carbon dioxide got rid of from, the lungs, nor is it possible within the scope of this lecture to describe the effect of any change in the hydrogen-ion concentration of the blood, intimately as this is associated with the gaseous exchanges taking place in the lungs. There is, however, one extremely important physiological conception to be grasped, if a true understanding of the errors of respiration is to be reached, and if an adequate guide to the nature of the best treatment is to be secured; this concerns the relations between tidal air and supplemental air. In 1916–17, when all kinds of physical conditions were to be found among pilots returning from overseas and among would-be pilots, I suggested to Colonel (then Captain) Martin Flack that the relative volume and position of the tidal air in relation to the complemental and supplemental air and to the vital capacity might be the subject of alteration and possibly, indeed, provide a key to some of the effects that were noticed. Flack took this up and, in his capacity as special research officer, demonstrated that the supplemental air was reduced in fatigued pilots with a corresponding increase in the residual air; and I cannot do better than quote his lucid description from his Milroy Lectures of what occurs:—

> "The case may be stated as follows. The normal fit individual is possessed of sufficient expiratory force to keep his residual air near the physiological minimum (say 1000 c.cm.). In the unfit person, owing to lack of good expiratory tone, the vital capacity becomes decreased and the residual air increased, with the result that the ventilation capacity of the individual is greatly decreased. This can be seen by a consideration of the following figures: Suppose a fit man has a vital capacity of 4000 c.cm. (ventilation capacity of 4 to 1); when, as the result of strain or unfitness, his vital capacity is reduced to 3500 c.cm. his residual air increases to 1500 c.cm., and his ventilation capacity is now only 2½ to 1; a reduction of the vital capacity to 3000 c.cm. and an increase of the residual air to 2000 c.cm. gives a ventilation capacity of 1½ : 1, instead of 4 : 1. As already stated, such vital capacities were frequently found and observation showed that they increased with treatment, rest, and exercise. I have had many examples of this. Recently, I saw a flying officer, who, on his return from Egypt after a considerable period of high flying followed by strain, had at his first examination a vital capacity of 2200 c.cm. Six months later, as the result of rest and exercise, it had increased to 5600 c.cm."

The above quotation deals chiefly with the effect of a diminution in the supplemental air, and it is necessary besides this to consider the effect of diminished vital capacity, of alterations in the volume and rate of tidal air, and of abnormal proportions of residual air such as must be present in an under-developed chest. Without entering into too great detail, it is not difficult to realise how easily a vicious circle can be set up by any alteration in the normal volumes of air concerned in the respiratory act. In order to illustrate this, I have drawn a diagram which is theoretical in so far as the actual proportions go, but can be considered (from many observations in the Royal Air Force) a fairly accurate representation of what probably exists in the various types.

Diagram showing Volumes of Air in Various Types of Lungs.



3. *Reflex and Other Effects.*—The heart and lungs and the whole of the thoracic viscera are supplied by sympathetic fibres accompanying for a part of their course the first five dorsal nerves. The sole station of these fibres is situate in the stellate ganglion, and they convey accelerator impulses to the heart. The abdominal viscera receive their sympathetic fibres from rami leaving the spinal cord with the lower six dorsal nerves and the upper three or four lumbar. Among their functions are vaso-constriction and vaso-dilatation. With this very brief reference it is easy to understand how the tone and condition of the twelve thoracic spinal nerves may affect the tone and condition of the accompanying sympathetic fibres. Again, the intermittent stretching and pressing of structures in the thorax and abdomen as a result of inspiration and expiration are undoubtedly of use in maintaining the tone of the muscles and viscera, as the diaphragm in its downward movement moves the liver and intestines, and thereby gives them a form of active massage (Flack).

To sum up, in order to have proper physiological functioning during breathing we require: (1) A regular increase in the volume of blood brought to the heart during inspiration; (2) suitable range of supply of fresh air and proportion between this and the residual air; and (3) healthy elastic lung tissue and healthy tone of the nervous mechanism of respiration.

RESPIRATORY MEASUREMENTS, ABNORMALITIES, AND TREATMENT.

With this preliminary survey of the anatomy and physiology of respiration, I propose to pass to a discussion of my subject under the following heads: (A) Respiratory efficiency measurements; (B) abnormalities of the respiratory act; and (C) treatment for respiratory deficiencies.

A.—*Measurements of Efficiency of Act of Respiration.*

Measurements, just as far as they are accurate, give reliable information about the thing measured. The complexity and sensitivity of the human mechanism make accurate measurement peculiarly difficult, but in the respiratory system it is particularly important to gain knowledge of the degree of efficiency of the act of breathing, and how this efficiency is affected by applied strain. Efficient methods of estimation not only assist diagnosis, but may actually guide and protect the progress of treatments. In dealing with the many cases where derangements of breathing are known to exist, or suspected, it is, perhaps, too optimistic to consider the application as a routine practice of such tests as the basal metabolic rate and coefficient of oxygen utilisation.

Tests of the efficiency of the act of respiration should as far as possible be: (*a*) able to be readily and

rapidly performed; (*b*) applicable to most ages and both sexes, without causing alarm or psychological upset; (*c*) productive of graphic and/or numerical results; (*d*) largely free from medical opinion or bias; and (*e*) unencumbered by apparatus and methods suitable only for a lengthy laboratory experiment.

It is not possible at present to set out a number of tests for respiratory efficiency that would fulfil all the above conditions, but it is possible to describe a number of tests that do undoubtedly give information of a fairly accurate nature while also avoiding long and extensive physiological procedure. These are: (1) the Dreyer coefficients of physical efficiency[6]; (2) the Flack tests; and (3) orthodiagraphic and other measurements of thoracic and diaphragmatic movements, &c.

I have placed the Dreyer measurements first because they are applicable to young children, and because Prof. Dreyer and his co-workers have now accumulated a very large number of observations on children and adults from all walks of life. The Flack tests, useful as they have proved to be, suffer under the disadvantage of being unsuitable for young children or individuals with any serious cardio-respiratory lesion. It should, however, be possible to introduce modifications that make them suitable. The orthodiagraph has been extensively employed by Halls Dally. This apparatus certainly gives attractive graphic records and takes into account diaphragmatic movement, but, owing to the rapidity of movement of the diaphragm and the heart, cannot be regarded as an instrument of precision. It may also be noted here in passing that the relative movements of the ribs and diaphragm alter considerably between the prone and vertical position; I refer to this point a little later. Besides this method, many means have been devised for estimating the extent and nature of the movement of the chest wall, and Arthur Ransome[7] has done much pioneer work on this subject, and more recently, Mumford.[8] I have examined a number of Ransome's original instruments devised as long ago as 1876 for the purpose of estimating the nature and extent of the movements of various parts of the thorax. These instruments show remarkable ingenuity, particularly the one which is designed to record simultaneously the movement of a rib in three planes. In the hands of a skilled observer they may be made to yield interesting results. They all, however, suffer from the disadvantages common to this type of recording apparatus—namely, insensitivity, too great lag, and inability to give good comparative values from day to day. In addition, they make no effort to measure the movement or power of the diaphragm, an important omission. I should point out here that no one was more keenly alive to these disadvantages than the inventor of these instruments, and no one deserves more credit than this careful, painstaking, and accurate observer. It is possible to overcome some of these drawbacks by employing electrical devices, but even when this is done, with all its advantages, the difficulty of obtaining apparatus suitable for use on the thorax is considerable. I am experimenting with the hot wire in this direction, but beyond some encouraging preliminary results, the work has not yet reached a practical basis. Another useful test suggested and elaborated by Prof. Dreyer is known as the Dreyer nitrogen test, but this again is also not very suitable for children, and has the disadvantage of necessitating the wearing of a mask or similar contrivance.

B.—*Abnormalities of the Respiratory Act.*

The normal expansion of the lungs may be interfered with by: (*a*) any obstruction in the upper respiratory passages—e.g., adenoids; (*b*) disease of the lungs themselves, pleura, or mediastinal glands—such as empyema or chronic broncho-pneumonia; (*c*) alterations in the shape or curves of the vertebral column, ribs, or sternum—congenital deformities, kyphosis, &c.; and (*d*) other conditions, such as loss of tone or actual paralysis of the muscles of respiration; abdominal swellings hindering the diaphragm; unsuitable corsets, clothes, and frequently also the pregnant uterus.

The effects of these conditions are not precisely similar.

(*a*) *Obstruction in the Upper Respiratory Passages.*—Where there is mild obstruction in the upper respiratory passages, the effect is a general reduction in the available path of movement of the muscles of respiration. Breathing is usually more rapid and particularly accelerated with exercise, while, owing to the lungs being unable to fill easily, the inspiratory effort is limited partly by the abnormal increase in the negative pressure of the thorax. In more severe cases the stimulus to the respiratory centre is sufficiently strong to create a powerful movement of the ribs. As the lung during this movement is now really starved of air, owing to the obstruction to free entry, something has to give way in order to compensate. The second series of ribs and/or the diaphragm do this. The appearance of the chest when the ribs are the chief victims is too well known to require description. When the diaphragm is the seat of the compensatory failure, it appears from X ray evidence to take place in two stages, the first when the downward plunge of the diaphragm is much diminished or does not take place, and the second when the diaphragm is actually sucked up and thereby diminishes the effect of the suck on the outer air caused by the enlargement of the thorax.

Diaphragmatic movements may therefore be described as either (1) normal or physiological, (2) stationary, or (3) reversed. X rays of stationary and reversed types of diaphragm are not easy to obtain in the recumbent subject, and should be taken in the erect position; in the lying position even advanced reversed breathing may appear normal, owing to the removal of the static constraint of the abdominal muscles. In this connexion two brief quotations from Keith's article in Hill's "Recent Advances in Physiology" are of interest:—

> "Mosso observed that the respiratory movement became thoracic in type when the horizontal position was assumed, a result which cannot be ascribed to an alteration in the elastic recoil of the lung. Mosso concluded that the assumption of the thoracic type of respiration in the supine position is brought about through a reflex action of the vagus, but in the writer's opinion the change is due to an alteration in the action of the expiratory muscles. The erect posture necessitates an increased action of the musculature of the belly wall in order to balance the body, the ribs being thus more firmly fixed than in the supine position; with the assumption of the supine position the musculature of the belly wall is relieved of its postural function, thus lessening the strain on the ribs and allowing them to move more freely. . . . . ."
>
> "From Hutchinson's, Dally's and my own observations the area of the diaphragm in contact with the lungs may be estimated at 250 sq. cm. A descent of 10 mm. all over gives an increase of 250 c.cm. of thoracic space; if one estimates an average quiet breath at 400 c.cm. it will be seen that the diaphragmatic movement plays a larger part than the costal movement. Hultkranz estimated that in taking a breath of 490 c.cm. 170 was the result of the diaphragmatic and 320 of the thoracic movement. Sewall and Pollard found that a larger breath could be taken by a thoracic inspiratory movement than by an abdominal one. R. T. Mackenzie has again verified Hutchinson's observation that there is no relationship between the extent to which the chest can be expanded in circumference and the amount of breath that is thereby taken in. The thorax can be enlarged so that the abdominal viscera instead of air are drawn into the thoracic cavity. At the London Hospital there was an old acrobat who could draw in this way all his abdominal viscera up into the thorax, so that the abdominal aorta was felt pulsating under the fingers from the epigastrium downwards. When the thorax is expanded beyond the extensibility of the lungs the abdominal viscera are drawn upwards to occupy the thoracic space; highly trained gymnasts at the army schools invariably obtain their great chest expansions in this way."

I want to lay special emphasis on the importance of any divergence from normality in the action of the

[6] Georges Dreyer: The Assessment of Physical Efficiency, Cassell and Co., 1920.
[7] A. Ransome: On Stethometry, Macmillan, 1876.
[8] A. A. Mumford: Estimation of Physical Fitness, THE LANCET, 1922, i., 478.

diaphragm, not so much from its effect on the ventilation of the lungs as upon its pumping action which assists in the filling of the heart. For a stationary or reversed acting diaphragm lessens the negative pressure in the thorax and the positive pressure in the abdomen, thereby diminishing both the aspirating effect and the pressure effect. There is also, of course, to be considered in every case of poorly-acting diaphragm the effect on the vital capacity, complemental, supplemental, tidal and residual air relations, and with this, alterations in the coefficient of utilisation of oxygen, basal metabolic rates, and hydrogen-ion concentrations. In addition, it should be remembered that the normal downward plunge of the diaphragm is the chief factor in expanding the apex of the lung; and Mr. H. M. Berry, assistant radiologist at St. Bartholomew's Hospital, informs me that reversed diaphragm breathing is most common among the Jews, and the liability of this race to apical phthisis is worth noting in this connexion as having some possible relation.

(*b*) *Disease of the Lungs.*—Disease of the lungs themselves, according to its extent and nature, tends to alter the inception, extent, and duration of movement of the various parts of the thorax, and ability to recognise the place and nature of these alterations by means of accurate measurement, forms an important guide to the type and seat of trouble; here the hot-wire microphone should prove of special value. The Dreyer coefficients, particularly

$$\frac{W.^{0\cdot72}}{V.C.} = K = 0\cdot691,$$

are useful in this category, especially if the ratio of the theoretical to the actual vital capacity is worked out.

(*c*) *Alterations in Shape of the Spine.*—This causes mechanical impediment to adequate movements, and kyphosis, in a minor degree, is usually present in cases of tonsil and adenoid obstruction. It is therefore in these cases, as Arbuthnot Lane points out, of the greatest importance to recognise the necessity for obtaining satisfactory position and movement in the spine.

(*d*) *Other Conditions.*—Loss of tone of the abdominal wall, as is so frequently seen in children, is important as (even with a diaphragm that is descending normally) the driving effect on the blood in the liver, &c., is lost because a flaccid abdominal wall does not give the necessary counter-pressure. We know also that poor abdominal tone means poor tone in the gut, with accompanying excess of blood in the vessels. That clothes may influence the breathing is obvious to anyone who has walked rapidly up a hill with clothes that do not allow of full freedom of rib and abdominal movement.

Before closing this section I would like to refer to the controversy that has raged in the past as to whether respiratory exercises could, or could not, cure adenoids. I am of opinion that in mild cases, if respiratory exercises definitely increase the vital capacity, slow the respiratory- and pulse-rates, and improve the ratio of vital capacity to residual air, then by bringing a better blood-supply and by more thorough removal of waste products they may induce a favourable reaction—i.e., a return towards normal and healthy tissues. In severe cases, where respiratory exercises show no, or only very slight, improvements in respiratory efficiency, little benefit can be expected without operation. While in those cases where respiratory exercises actually tend to push the diaphragm towards reversed action and show impaired respiratory efficiency measurements, then operation is essential. We can therefore see how the two schools, one stating that operation is necessary for a cure, and the other that cases can be cured by breathing, are not mutually incompatible. Each has its legitimate field which should be selected after adequate measurements on repeated occasions.

Treatment for Respiratory Deficiencies.

I am afraid that respiratory exercises have fallen into disrepute and their real value misjudged because they are too frequently carried out in slavish imitation of a special system such as the Swedish system. Too often also, breathing exercises convey to the masseur, practitioner, and patient, merely one set of uninteresting movements, nor are they aware or informed in what particular part the normal respiratory act has become abnormal. Without this knowledge, suitable treatment is necessarily haphazard and ill-informed. It must be remembered continually by all interested in the value and application of massage and remedial exercises that the Swedish exercises are, even to-day, similar to the exercises devised by Ling in 1805. The physiology of to-day is so totally different from the physiology of Ling's time, that it is easy to understand how his special exercises may be, and often are, based on physiological fallacies.

It is no use to increase the mobility of the thorax in a case of tonsils and adenoids if the vital capacity is not correspondingly increased, and if the only result of such increased mobility is a tendency to reversed diaphragmatic breathing. The lung that has had an empyema requires special treatment, with special reference to the affected side. The lung that expands poorly owing to abnormal curves in the spine may do so with freedom when the vertebral column regains its normal mobility and position.

It would be quite impossible to define in anything short of a book, the precise respiratory treatment required in various abnormalities. Certain rules can, however, be formulated:—

(*a*) Where there is abnormal movement of the diaphragm unassociated with severe obstruction to air-entry, re-education of the normal use of the diaphragm should be the first care. This should be commenced in the lying position. It is not difficult to achieve success owing to the degree of voluntary control possessed by the individual over his respiratory movements.

(*b*) When the respiration is normal but the vital capacity seriously diminished, the value of passive respiratory exercises with over-stretching is great.

(*c*) When the supplemental air is diminished as well as the vital capacity, particular attention should be paid to expiratory movements, such as suggested by Flack.

(*d*) Where there is kyphosis or similar changes, the first duty is to secure fuller movement, &c., in the thoracic vertebræ affected.

(*e*) When the respiration is normal but the volume output of the heart per beat is small owing to lack of tone in the abdominal walls or viscera, treatment should be particularly directed to the restoration of this tone.

(*f*) When the movements of the thorax are largely confined to one diameter or one of the rib series temporary fixation or impedance of the active part, with re-education of the inactive, may be required before good movement is restored.

(*g*) When the thoracic nerves and/or the spinal muscles are "out of condition," as so frequently occurs in cases of poliomyelitis, tonsils and adenoids, &c., then appropriate diathermy, interrupted faradic stimulation, kathodal galvanism, radiant heat, or vibrations may be required to assist in restoring normal function.

The consideration of these general rules makes it clear that the value of respiratory exercises depends largely upon the availability of combined treatment. By combined treatment I refer particularly to the combined use of massage, re-education, passive and active exercises, and electro-therapeutical treatment. The galvanic and faradic currents, ionisation, and diathermic treatment, as well as massage and exercises, each have their use in cases of respiratory deficiency.

SUMMARY.

I may therefore conclude with the following general points upon the value of respiratory exercises, which are only of real value:—

1. If the exact nature of the abnormality it is desired to remove is known and if the abnormality presents no insuperable mechanical obstruction to improvement.

2. If a measure of this abnormality has been secured and if the progress of treatment is checked and followed by re-measuring.

3. If the treatment is able to combine and utilise our knowledge of electro-therapeutics, massage, and remedial exercises so that accurate and detailed prescriptions may be drawn up based on a sound knowledge of the errors of each individual case.

THE VITAL CAPACITY CONSTANTS APPLIED TO THE STUDY OF PULMONARY TUBERCULOSIS.[1]

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IN 1919 one of us published a paper[2] dealing with the normal vital capacity in man. In this paper it was shown that definite relationships exist between vital capacity (V.C.) and body surface, body weight, trunk length and the chest circumference, expressed by the following formulæ:—

1. $\frac{W^n}{V.C.} = K_1$, where the power n is 0·72. W is net body weight in grammes and V.C. is vital capacity in cubic centimetres.

2. $\frac{\lambda^n}{V.C.} = K_2$, where the power n is 2·26 in males, and 2·3 in females. λ is the trunk length in centimetres.

3. $\frac{Ch^n}{V.C.} = K_3$, where the power n is 1·97 in males and 2·54 in females. Ch is the circumference of the chest in centimetres.

The same author, in his book "The Assessment of Physical Fitness,"[3] gives tables which save the trouble of working out the various formulæ. As we thought it was important to apply these formulæ in cases of tuberculosis of the lung, we decided to work jointly on the following lines. One of us (L. S. T. B.) was to examine and make clinical notes of the patients, and also to take the various measurements required for the above formulæ. The other (G. D.) was to have no knowledge of the patients, but was to form an opinion as to (1) classification; (2) prognosis; (3) the result of treatment—whether the patient was improving, remaining stationary, or getting worse—solely from the measurements supplied to him. The result of this work was published in THE LANCET in 1920.[4] Since then we have followed the cases for a further period of two years, and have examined many new cases. In this paper we describe the result of our work up to date. Those cases mentioned in our paper of 1920 and referred to again now have the same numbers in both papers. The V.C. is expressed in the same way—namely, in percentages above or below normal. A patient, for example, whose V.C. is 85 per cent. of the normal is described as having a V.C. of −15.

In this paper we concern ourselves only with definite cases of pulmonary tuberculosis, and in each case mentioned tubercle bacilli have been found in the sputum at some time. There are 267 cases in this series. In one case the V.C. was above normal. This patient, a male aged 30, had a cold in December, 1919, and tubercle bacilli were said to be present in his sputum. Consequently he was sent to hospital in January, 1920, and his V.C. was + 13·9. No tubercle bacilli were found, and the complement-fixation test was negative; he had no signs or symptoms of disease by clinical or X ray examination. He returned to work in March, and has remained fit since. Last seen in February, 1922, his V.C. was + 10, he was doing full work and no signs or symptoms of disease were found. The other 266 cases we have divided into three groups according to the Turban-Gerhardt classification, and Table I. shows the V.C. in the different groups.

TABLE I.—*Vital Capacity Percentage Below Normal.*

Turban-Gerhardt Group.	0–10	10–20	20–30	30–40	40–50	50–60	60–	Total.
I.	27	35	28	13	7	3	—	113
Percentage	23·9	31	24	11·5	6·4	2·7	—	—
II.	—	10	16	26	24	3	2	81
Percentage	—	12·3	19·8	32·1	29·8	3·7	2·6	—
III.	—	3	7	19	19	17	7	72
Percentage	—	4·3	9·7	26·4	26·4	23·6	9·7	—

Dr. Charles Cameron,[5] of Glasgow, has recently published a similar table, and it is interesting to compare his figures with our own.

TABLE II.—*Vital Capacity Percentage Below Normal (Dr. Cameron's cases).*

Turban-Gerhardt group.	0–10	10–20	20–30	30–40	40–50	50–60	60–70	70–80	Number in group.
	Per cent.								
I.	20	26·7	20	26·7	6·6	0	0	0	15
II.	0·98	16·7	35·3	31·4	11·7	0·98	1·96	0·98	102
III.	0	0	3·7	22·2	34·6	25·9	8·6	5	81

The figures in these two tables are very similar and show that V.C. does diminish as the extent of the disease increases, for the Turban-Gerhardt classification is an anatomical one based on the amount of lung diseased. But some cases in Group III. have a larger V.C. than some in Group I., and it is clear that the extent of disease in the lung is not the only factor in determining V.C. Toxæmia is the chief factor, and we see the V.C. rapidly becoming lower and lower in acute toxic cases, whereas it remains more or less constant in extensive fibroid cases. The following cases illustrate the steady diminution in V.C. in advancing cases:—

CASE 62.—Male, aged 33.

	V.C.		V.C.
1919, May	−48·1	1920, Aug.	−76·7
,, Oct.	−53·9	,, Nov.	(died)
1920, March	−62·1		

CASE 237.—Male, aged 20.

	V.C.		V.C.
1920, Jan.	−34·6	1921, April	−62·4
,, June	−36·5	,, May	−61·8
,, July	−39·0	,, Sept.	−62·5
,, Aug.	−49·0	1922, Jan.	−69·6
,, Oct.	−49·0	,, April	(died)
1921, Jan.	−44·0		

CASE 272.—Male, aged 22. Acute Tuberculosis.

	V.C.		V.C.
1920, March	−16·9	1920, July	(died)
,, May	−62·0		

CASE 286.—Male, aged 32.

	V.C.		V.C.
1920, March	−33·1	1920, Dec.	−41·4
,, April	−34·9	1921, Feb. 10th	−52·0
,, May	−36·0	,, ,, 28th	−51·6
,, Sept.	−37·2	,, May	−52·0
,, Oct.	−39·1	,, June	(died)
,, Nov.	−41·4		

The diminution in V.C. is not always regular, but an exacerbation of disease will cause a diminution in V.C. which may be followed by an increase if the patient makes a temporary improvement. This again is followed by a diminution in V.C. as the disease progresses. The following cases show this:—

CASE 107.—Male, aged 18.

	V.C.		V.C.
1919, May	−25·2 (*a*)	1920, Aug.	−44·3
,, Oct.	−35·5	,, Oct.	−50·5
1920, Feb.	−40·4	1921, Jan.	−42·0
,, April	−39·4	,, April	−50·5
,, June	−34·0	,, Oct.	−50·3
,, July	−34·0	1922, Jan.	−63·0 (*b*)

(*a*) He had just returned from six months' sanatorium treatment. (*b*) Very advanced condition.

[1] Being a further report to the Medical Research Council.
[2] Dreyer, G.: The Normal Vital Capacity in Man and its Relation to the Size of the Body, THE LANCET, 1919, ii., 227.
[3] Dreyer, G., and Hanson, G. E.: The Assessment of Physical Fitness. Cassell and Co., London, 1920.
[4] Dreyer, G., and Burrell, L. S. T.: The Vital Capacity Constants Applied to the Study of Pulmonary Tuberculosis, THE LANCET, 1920, i., 1212.
[5] Cameron, Charles: The Vital Capacity in Pulmonary Tuberculosis. Tubercle, 1922, iii., 337 and 385.

CASE 337.—Male, aged 28.

	V.C.		V.C.
1920, Aug. 12th	−46·6	1920, Nov. 13th	−48·0
,, Sept. 16th	−54·9	,, ,, 27th	−51·0
,, ,, 30th	−58·5	,, Dec. 22nd	−75·8
,, Oct. 14th	−52·0	1921, Jan. 19th	−63·2
,, ,, 29th	−52·0	,, Dec.	(died)

In the following cases the V.C. remained more or less constant. It will be seen that the patients' condition reaches a certain level and then remains stationary for a long period. The level may be high or low.

CASE 1.—Female, aged 18.

	V.C.		V.C.
1919, April	−24·5 (*a*)	1922, March	−20·2 (*c*)
1921, May	−21·0 (*b*)		

(*a*) Infiltration and fibrosis left apex. (*b*) Fibrosis at left apex. (*c*) Condition unchanged.

CASE 5.—Male, aged 39.

	V.C.		V.C.
1919, April	−50·0 (*d*)	1921, April	−50·7
1920, Feb.	−50·6	1922, Jan.	−51·0 (*e*)

(*d*) Chronic fibroid disease of both lungs. (*e*) Condition much the same.

CASE 89.—Female, aged 21.

	V.C.		V.C.
1919, May	−33·5 (*f*)	1920, Oct.	−33·5
1920, Jan.	−32·5	1921, April	(*g*)
,, June	−27·5	1922, Jan.	−37·2 (*h*)
,, Sept.	−31·5		

(*f*) Infiltration of both lungs. (*g*) Reported, condition unchanged. (*h*) Fibrosis both lungs.

CASE 441.—Male, aged 22.

	V.C.		V.C.
1920, Dec.	−69·7 (*i*)	1921, Feb.	−65·6
1921, Jan.	−64·8	1922, Feb.	−69·6 (*j*)

(*i*) Fibrosis of both lungs. (*j*) Condition unchanged.

In the following cases the disease has spread and the patients' condition become worse after a preliminary stage of improvement.

CASE 15.—Male, aged 34. Infiltration left apex and tubercle bacilli in the sputum, but no tubercle bacilli found on leaving the sanatorium in April, 1919.

	V.C.		V.C.
1919, April	−8·5	1920, Sept. 6th	−58·0
,, Oct.	−12·0	,, ,, 22nd	(died)

CASE 63.—Female, aged 23.

	V.C.		V.C.
1919, May	−21·9 (*a*)	1920, Oct.	−30·0
1920, Jan.	−10·5	1921, Jan.	−35·5
,, July	−24·5	,, May	−57·0
,, Sept.	−24·3	,, Dec.	(died)

(*a*) San. May–July.

CASE 260.—Male, aged 28. Infiltration R. apex. Sanatorium.

	V.C.		V.C.
1919, Sept. } 1920, Jan. }	(*b*)	1920, May	−12·0
		,, Aug.	−17·8
,, Feb.	−2·0	1922, Jan.	−37·0 (*c*)

(*b*) Condition much improved. (*c*) Signs of disease in both lungs.

CASE 262.—Male, aged 19.

	V.C.		V.C.
1920, Feb.	−15·2 (*d*)	1920, July	−5·8 (*f*)
,, April	−5·8 (*e*)	1921, Aug.	−23·6 (*g*)
,, May	−8·5	1922, Jan.	−31·0 (*h*)
,, June	−7·9		

(*d*) Early infiltration L. apex. (*e*) Went to san. in March. (*f*) Left san. and returned to work in July. (*g*) Not working. (*h*) Signs in both lungs. Losing ground.

CASE 278.—Male, aged 29.

	V.C.		V.C.
1920, March	−11·3 (*i*)	1920, Nov.	−1·5 (*j*)
,, Aug.	−5·5	1921, April	(*k*)
,, Sept.	−1·5	1922, Jan.	−22·0 (*l*)

(*i*) Early infiltration R. apex. Went to san. in February. (*j*) Left san. in November. (*k*) Reported fit and at work. (*l*) Unfit for work since July.

CASE 304.—Male, aged 20. Early infiltration R. apex in September, 1919. San. September, 1919–April, 1920.

	V.C.		V.C.
1920, May	(*m*)	1920, Dec.	−29·5
,, Aug.	−2·6 (*n*)	1922, Jan.	(died)

(*m*) Normal. No tubercle bacilli. (*n*) Tubercle bacilli present.

The following case illustrates the value of V.C. in the diagnosis of doubtful cases.

CASE 135.—Man, aged 23. Severe hæmoptysis diagnosed as tuberculosis because no other cause could be found. No tubercle bacilli found in the sputum. X ray showed no signs of disease of the lungs. Complement-fixation test negative.

	V.C.		V.C.
1919, June	+14·6	1921, June	+14·8
1922, June.	No signs or symptoms of disease.		

The following cases show the V.C. when the disease has apparently become arrested.

CASE 123.—Male, aged 35.

	V.C.		V.C.
1919, June	−30·5 (*a*)	1922, March	+ 0·9 (*b*)

(*a*) Infiltration L. apex. Tubercle bacilli present. (*b*) No signs or symptoms of disease.

CASE 127.—Female, aged 23.

	V.C.		V.C.
1919, June	−38·8 (*c*)	1920, Nov.	− 5·6
1920, March	− 5·6	1922, Feb.	−13·0 (*d*)
,, May	−11·2		

(*c*) Early infiltration of lung. Tubercle bacilli present. San. May, 1919–January, 1920. (*d*) No tubercle bacilli or signs of active disease.

CASE 189.—Male, aged 30.

	V.C.		V.C.
1919, Oct.	−12·6 (*e*)	1920, April	+11·7 (*f*)
,, Nov.	+ 4·6	1922, Feb.	(*g*)
1920, Jan.	+ 3·9		

(*e*) Early infiltration R. apex. San. October, 1919. (*f*) Left san. in April. (*g*) Reported fit and at work.

CASE 327.—Male, aged 28.

	V.C.		V.C.
1920, June	−13·9 (*h*)	1921, April	− 2·0 (*i*)
,, Sept.	− 9·5	1922, Feb.	(*j*)
,, Nov.	− 7·6		

(*h*) Early infiltration R. apex. (*i*) Left san. and returned to work in February, 1921. (*j*) Reported fit and at work.

It sometimes happens that although patients have improved sufficiently or are well enough to be sent to sanatorium they lose ground in spite of treatment there. This is illustrated by the following cases :—

CASE 178.—Male, aged 20.

	V.C.		V.C.
1919, Sept.	− 2·2 (*a*)	1920, June	−33·2
1920, Jan.	−25·7	1921, May	(died)
,, March	−25·7		

(*a*) Early infiltration L. apex. San. November, 1919–March, 1920.

CASE 319.—Male, aged 27.

	V.C.		V.C.
1920, June	−19·0 (*b*)	1920, Sept.	−22·9 (*c*)
,, Aug.	−21·8	1922, Jan.	−56·5 (*d*)

(*b*) Went to san. in July. (*c*) Left san. in October. (*d*) Advanced disease. Condition bad.

An attack of hæmoptysis, pleurisy, influenza, or other complications will have an immediate effect on the V.C. The following cases show this :—

CASE 279.—Male, aged 24.

	V.C.		V.C.
1920, March	− 6·3 (*a*)	1921, July	−16·6
,, Aug.	−29·0 (*b*)	,, Oct.	−10·7
,, Oct.	−20·6 (*c*)	1922, Jan.	−11·7 (*e*)
,, Dec.	−14·5 (*d*)	,, April	−18·0 (*f*)
1921, April	−15·2		

(*a*) Early infiltration L. apex. Went to san. in April. (*b*) In bed after hæmoptysis. (*c*) Leaving san. (*d*) Has returned to work. (*e*) Still at work. (*f*) Just returned to work after influenza.

CASE 283.—Male, aged 19.

	V.C.		V.C.
1920, March	−23·6 (*g*)	1920, Sept.	−23·5 (*i*)
,, April	−18·3 (*h*)	,, Nov.	−15·7 (*j*)
,, May	−14·6	1921, May	−13·4 (*k*)
,, June	− 9·0		

(*g*) Early infiltration L. apex. (*h*) To san. in April. (*i*) Hæmoptysis in July. (*j*) Leaving san. (*k*) At work since December.

The following table shows the percentages below normal in the V.C. at different periods before death.

TABLE III.—*Vital Capacity Percentage Below Normal.*

Months before death.	0–10	10–20	20–30	30–40	40–50	50–60	60
3	—	—	—	—	6	7	7
6	—	2	3	4	5	6	6
9	1	0	5	4	7	5	2
12	1	2	4	12	5	5	5
18	4	4	3	5	8	3	—
24	—	3	4	6	3	—	—
30	—	2	2	3	—	—	—

With regard to body-weight in pulmonary tuberculosis we find that the usual relationship with V.C. does not exist. At the beginning of the disease patients invariably lose weight and the V.C. in relation to weight is higher than in relation to stem length. Again, after sanatorium treatment with forced feeding, patients often become heavier than they were

normally and their weight is artificial. Most patients lose weight after sanatorium treatment even if the disease is arrested. Having reached the normal weight for the stem length and chest measurement they maintain this weight if the disease is arrested, and then the relationship between weight and V.C. is found. During the loss of weight owing to increasing disease or the gain of weight during forced feeding and rest, however, there is no reliable relationship with V.C. The significance of weight is seen when patients after treatment have returned to their normal lives; a normal weight maintained is a good omen, but steady loss of weight indicates that the disease is spreading.

Conclusions.

The conclusions at which we arrived in 1920 seem more than justified now after a further two years study of the cases.[6]

1. In cases of pulmonary tuberculosis there is a definite decrease in V.C. But after treatment the V.C. may improve, and as in one of our cases (No. 304) actually become normal, in spite of the fact that the disease later broke out again and proved fatal.

2. An improvement in the clinical condition of the patient is found to be accompanied by an increased V.C., whilst an advance of the disease results in a decreased V.C.

3. The determination of the V.C. is useful for the classification of cases of pulmonary tuberculosis, because it is possible by this means numerically to express the injury to health (e.g., degree of toxæmia and amount of lung diseased) which otherwise would depend on the individual interpretation of physical signs by different observers. In this connexion it should be noted that classification by physical signs alone may place a patient nearing death from an acute lesion in a high category, whilst another patient, with satisfactory fibrosis and extensive cavitation, likely to live for several years, may be placed in the lowest category. Dr. Cameron[5] criticises this conclusion and rightly points out that the V.C. may be low, not only because of toxæmia, but also because of extensive fibrosis, and thinks that V.C. alone is of very restricted value and should be taken in conjunction with physical signs. We agree with Dr. Cameron if one reading alone is taken, and are of opinion that one reading alone is always of restricted value. The importance lies in taking repeated readings, as Dr. Cameron himself shows. For instance, one of us (L. S. T. B.) from London used to visit at Oxford the other (G. D.) who knew nothing whatever about the condition of the patient. If the percentage readings presented to him were say: − 40, − 39·6, − 41, − 40·4, − 39·8, − 40·8, over a period of six months, he would at once say, "Chronic case holding his own"; on the other hand, *if* the readings were − 26, − 30, − 29, − 38, − 46, − 48 he would say: "This patient is dying." So impressed were we by the accuracy of these findings that one of us (L. S. T. B.) published a classification based largely on V.C.

4. As an aid to diagnosis even a single, but more particularly a repeated examination of the V.C. of doubtful cases will also prove useful. If a normal V.C. is found, this patient is most unlikely to be suffering from pulmonary tuberculosis, whereas if the V.C. is much decreased this patient should be suspected, though it must always be borne in mind that other diseases may also cause a lowering of the V.C.

5. Finally a systematic study of the V.C. in its proper relationship to body size has given important information as to the beneficial effects of different treatments of pulmonary tuberculosis.

After many thousand observations we have seen no ill-effect from taking V.C. We note that Dr. Cameron after 6000 readings has found no ill-effect, and we fail to see why it should be harmful. It is, in our opinion, far less strain to the patient than even a mild attack of coughing.

[6] Since this report was prepared a paper by J. A. Myers with similar conclusions, entitled "Comparison of Vital Capacity Readings and X Ray Findings in Pulmonary Tuberculosis," has appeared. Amer. Rev. Tub., 1922, v., 884.

THE BED ISOLATION OF CASES OF INFECTIOUS DISEASE.

I. FURTHER EXPERIENCE AT FAZAKERLEY.

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DURING the period February, 1920, to June, 1922, the following cases of infectious disease have been treated in one bed-isolation ward of 26 beds at the Fazakerley Isolation Hospital:—

Measles	108	Measles with—	
Chicken-pox	45	Whooping-cough	4
Diphtheria	19	Diphtheria	3
Whooping-cough	20	Chicken-pox	2
Scarlet fever	56	Scarlet fever with—	
Mumps	5	Chicken-pox	1
Cerebrospinal fever	14	Whooping-cough	1
German measles	65	Diphtheria	1
Acute ant. poliomyelitis	2	Mumps	1
Encephalitis lethargica	6	Whooping-cough with—	
Typhoid fever	29	Chicken-pox	3
Scabies	1	German measles	1
		Erysipelas	80
		Anthrax	2
		Other diseases	138

Of this total one case only developed a secondary infection—namely, a patient admitted with whooping-cough on Dec. 8th, 1921, who developed chicken-pox on Jan. 29th, 1922. The circumstances under which these patients were admitted to a bed-isolation ward were similar to those laid down in a previous report.[1]

The cases were admitted in all stages of infection, they were chiefly of susceptible ages, and they include under the group "other diseases" a large number of conditions not commonly included amongst the acute infections—e.g., tonsillitis, pneumonia, and tuberculosis.

The routine observed for the avoidance of secondary infection is shown in the following transcript from the printed notice hung up in the ward:—

BED ISOLATION AT THE CITY HOSPITAL, FAZAKERLEY.

Precautions to be Observed.

COATS to be worn for *every* purpose, and hands washed (using nail-brush) after their removal.

Feeding and drinking utensils to be rinsed and placed, immediately after use, into the kitchen steriliser. They must not be laid down in the sinks in the kitchen or elsewhere. Coats must not be worn in the kitchen, but the nurse should return to the bedside bowl for washing purposes after taking out the feeding utensils, &c.

In wards, other than "G" and "C," bed-isolation crockery must be distinctive, or separately marked.

Separate and marked sanitary utensils, lavatory cloths, bath blankets.

Coat must be worn when removing clothing, bedding, sanitary utensils, &c., to the lavatories; the coat to be subsequently removed at the bedside and hands disinfected.

Separate washing-bowl, towel, nail-brush, and thermometer to be used in cases of chicken-pox, measles, enteric fever, and in any case where the treatment is likely to be frequent or prolonged.

Patients not to be allowed to mix with other patients, sit at common table, or use lavatories.

Bedside bowls to be immediately emptied and refilled after use. For this purpose the nurse must *not* wear coat to lavatory. The coat must be removed and hands washed, using nail-brush, *before* refilling bowl.

All temperatures to be taken in axilla, and thermometer washed in lysol after use.

No toys, books, or papers to be allowed.

The doctor will decide which patients are to undergo bed isolation, but all patients admitted to the bed isolation wards are to be so dealt with from the moment of admission until the doctor has visited the wards and given his instructions in the case. The only exception to this rule is erysipelas, which is to be treated with ordinary cleanliness only.

No nurse engaged in the active treatment of puerperal fever is to attend, in any way, upon a case of erysipelas or scarlet fever. Rubber gloves (reserved for the purpose) must be used in vaginal douching.

[1] C. Rundle and A. H. G. Burton: THE LANCET, 1912, i., 720.

Precautions to be Taken When Patient Dies or is Discharged.

Bedding, personal clothing, towels, bath blankets, coats, &c., to be at once placed in bundle and labelled for disinfector.

Patient's soap, flannel, and tooth-brush to be destroyed.

Brush and comb to be washed in lysol.

Bed mackintoshes, bedside locker, bedstead, temperature chart-holder, and bedboard to be washed with soap and water.

Precautions to be Observed When Coats are Omitted from a Case.

These must vary according to the nature of the case, and the nurse must take the instructions of the doctor.

It is of interest to note that only one of the pre-war nursing staff has been available for this work—viz., the sister-in-charge—the remaining members of the ward staff being wholly without previous experience in this branch of nursing. A second bed-isolation ward has been in operation at the Sparrow Hall section of the Fazakerley Hospital for a period of one year. The figures for this ward have not yet been collated, but so far no case of cross infection has occurred, although no member of the staff of this section (other than the matron) has had previous experience of bed-isolation work.

A necessary and obvious reservation in the presentation of the results of any method of hospital isolation arises from the possibility of secondary infections developing after the patients' discharge from the institution. It is not considered probable, however, that such an event would escape notice under the conditions of public health administration obtaining in a provincial area.

Bed-isolation work at this hospital has been under the observation of visitors interested in infectious hospital administration for a number of years, and an inspection of the wards and case-records has made it very clear that the incidence of secondary infection is considerably less than that commonly observed in a one-disease ward. The administrative and economic advantages are equally obvious.

II. EXPERIENCE AT PLAISTOW.

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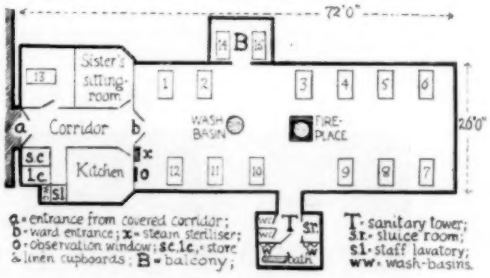
THE isolation of individual cases in main wards was first put into practice at Plaistow Hospital by the late Dr. J. Biernacki in 1906, when he introduced the "barrier" system of nursing. By this method a limited number of cases with "mixed" infections can be nursed in the common wards. Each barriered bed is supplied with a complete outfit of everything required in the treatment of the case, so that the patient is practically in a separate ward except as regards the common air-supply. Separate gowns are worn by the medical officer and nurses while attending the case, and the hands are dipped in disinfectant lotion before touching the patient or any of his equipment and again on leaving the bedside. As the strict observance of all the details means a good deal of extra work for the nursing staff, not more than two cases are isolated in this manner in a main ward at one time. Such diseases as diphtheria, mumps, whooping-cough, rubella, typhoid, erysipelas, and general septic infections are controlled by the barrier system, but it has failed in the case of three diseases—viz., chicken-pox, measles, and scarlet fever. This method is still used at Plaistow, and has been found most valuable, especially for patients admitted with septic discharges and spreading skin infections; its employment keeps the main wards clean and saves the transferring of such cases to side-wards or isolation blocks.

Following the successful work of Dr. Claude Rundle at the Fazakerley Hospital, a bed-isolation ward was opened by Dr. Biernacki at Plaistow in the autumn of 1912. This ward is a modern one of 12 beds, well lighted, well ventilated, and having 12 feet of wall space and 156 feet of floor space for each bed. A covered balcony for two beds opens off one side of the ward, and annexed to the entrance corridor is a side-ward for one bed, thus giving accommodation for 15 patients in all. Cots are placed along one side of the ward and beds on the other, including the balcony and side-ward. The sanitary annexe opens from the side of the ward. Placed in the centre of the floor is a wash-basin with hot and cold spray, fitted with elbow taps. A steam steriliser is fixed in the ward at the side of the entrance for boiling all feeding utensils. There is another steriliser in the sluice room for boiling wash-basins, bed-pans, urine bottles, &c. The general furniture of the ward is reduced to a minimum.

A better idea of the disposition of the beds, &c., will be obtained from the accompanying sketch (Fig. 1).

FIG. 1.—*Sketch Plan of Bed-Isolation Ward.*


72'0"
B
Sister's sitting-room
Corridor
WASH BASIN
FIRE-PLACE
26'0"
Kitchen
a = entrance from covered corridor; b = ward entrance; x = steam steriliser; o = observation window; sc. lc. = store & linen cupboards; B = balcony;
T = sanitary tower; sr. = sluice room; sl. = staff lavatory; ww. = wash-basins.

The nursing staff of the ward consists of one sister with general and fever training, one senior and two junior probationers for day duty, and one senior probationer for night duty. The day staff relieve themselves for off-duty time, but the night nurse is relieved by another probationer who has had experience in the ward. The probationers are not specially chosen for the work, and many of them obtain several months' experience in this ward during their two years' period of training. When a nurse first goes on duty in the ward the nature of the work and the reason for all the precautions are explained to her by the sister. She is kept under the sister's close observation until she understands the meaning of surgical cleanliness and has grasped all the details.

Nursing Routine.

The following is a very brief description of the nursing routine: The ward has a common stock of feeding and nursing utensils which are boiled immediately after use. Of other nursing articles, a complete outfit is reserved for each bed; for example, bath-towel, bath-blanket, soap, bib, duster, hair-comb are kept in each bed-locker. On the bed-board, at the head of the bed, are hung the patient's charts, treatment sheet and history sheets in metal cases, also gowns for doctor and nurse (see Fig. 2). Each patient has his own thermometer, kept in a small glass container on the bed-board. A half-minute sandglass in a metal case is used for taking the pulse, and the charting is done with a lead pencil which is afterwards burned; the pencil and sandglass are tied together and hung on the bed-board. A card is placed on each bed-board stating the regular disease and any secondary infection from which the patient is suffering, also the position of the bed in the ward and the diseases treated in each of the other beds at the time. Should cross-infection occur the particulars are all noted down on this card.

When a patient is discharged his bedding is sent to the laundry and all the other nursing utensils are either boiled or steeped in strong disinfectant. The bedstead, bed-locker, and bed-board are thoroughly washed and scrubbed with soap and water containing 1 in 200 lysol, and the floor in that area is polished. The nurse works with her arms bare to the elbows and has her hair completely covered by her cap. On

going to attend a patient, the first thing she does is to put on the gown hanging at the head of the bed, and when she has finished with the case she leaves the gown in its place, goes straight to the wash-basin and washes her hands and forearms in running water.

With the exception of uncomplicated scarlet fever cases which are sent to a convalescent home after the third week of illness, the majority of the patients are kept in the ward until they are fit to be discharged. They are not allowed to mix during convalescence, nor have they the common use of any article in the ward. They are all blanket-bathed in bed and never go into the sanitary annexe for any purpose. No toys, books, or papers are allowed in the ward. When they are fit to get up, the patients sit by their own bedside or, in fine weather, they go out in turns to the airing court. This may, perhaps, seem harsh treatment, but in practice we have found that the patients of this ward are the happiest in the hospital. They do not appear to feel the lack of toys, and when past the acute stage they sit up in bed and carry on a lively conversation from one end of the ward to the other. Even when they are getting up little difficulty is experienced in restricting them to their own bedside. By this time they are accustomed to the ward routine, and are easily made to understand that they must not leave their own area. Contact, however, occurred on two occasions during the past three years and resulted in cross-infection in each case. These cases are referred to below.

It is recognised that it would be difficult to get adults to submit to this rather rigorous treatment, and especially to deprive them of all books, papers, and such materials during convalescence. For this reason only children under 12 years are admitted to the ward. Cases over that age are treated in the side-ward, where books, papers, and writing materials are allowed.

Cross-infection.—When the ward was first opened only convalescent cases were treated in it during the first six weeks. Then, as the staff became accustomed to the work, acute cases were gradually admitted. Between two and three hundred cases were treated in the ward by Dr. Biernacki during the two years preceding the outbreak of war. Cross-infection, I understand, occurred with two diseases,—viz., scarlet fever and chicken-pox. One patient developed scarlet fever in the ward and chicken-pox spread to other patients on two occasions. The system had to be discontinued shortly after the outbreak of war owing to the difficulty in obtaining a competent nursing staff.

Types of Disease Isolated.

Towards the end of May, 1919, when nursing conditions had improved, the ward was again opened for bed isolation, and has been used for that purpose ever since. The diseases treated in it have all been acute, the type of case admitted being as follows:—

1. All cases suffering from two or more infections on admission.
2. All diseases not regularly admitted to the hospital and for which there is no main ward accommodation —e.g., cerebro-spinal fever, measles, whooping-cough, chicken-pox, erysipelas, pneumonia.
3. Cases in which the diagnosis is doubtful on admission.
4. Transfers from the main wards of cases which develop secondary infections.
5. Ordinary cases of scarlet fever and diphtheria, admitted when the main wards are pressed.

With the exception of the side-ward, which is reserved for adults, the majority of the patients are placed in the ward just as the beds happen to be vacant. At first, cases of measles and chicken-pox were put into end beds or in positions where the patients on each side of them were protected by previous attacks of these diseases, but I have lately discontinued this practice, as I am not satisfied that any advantage was gained by it. To pick out a "safe" position for any particular case usually means the moving of one or two other patients in the ward, and this I consider is always risky. It creates a lot of extra work for the staff, as the area from which any patient is shifted has to be thoroughly cleaned before a new case is put into it, and also frequent changing of the patients' positions might lead to some confusion.

During the past three years 482 cases have been treated in the ward. The length of time these patients were under treatment varied from 1 to 130 days, the average number of days spent by each patient in the ward being 29·5 days. Cross-infection occurred with three diseases—viz., scarlet fever, whooping-cough, and measles—and resulted in eight patients contracting a secondary infection. Briefly, the secondary cases arose as follows: In June, 1919, a whooping-cough case contracted scarlet fever from contact with a scarlet fever patient in the next bed. In November, 1920, two cases contracted scarlet fever, the source of the infection being unknown. In January, 1922, a mentally deficient patient, whose movements could not be controlled in the ward, contracted whooping-cough. On March 30th, 1922, two cases contracted measles. One of these developed the disease at home six days after being discharged. Three weeks later two other patients contracted measles. On neither occasion was the source of the infection traced. Further details of these cases are given as follows.

FIG. 2.—*Interior of Bed-Isolation Ward.*

Reproduction of photograph showing bed-boards with gowns for doctors and nurses at head of each bed.

TABLE I.—*Number of Cases Treated, and the Diseases from which They Suffered.*

	Cases.		Cases.
Scarlet fever	81	Measles	16
Ditto (septic cases)	25	Ditto with—	
Ditto in combination with—		Pneumonia	9
		Whooping-cough	2
Diphtheria	57	Whooping-cough	3
Whooping-cough	9	Rubella	7
Chicken-pox	6	Chicken-pox	3
Measles	12	Pneumonia	11
Measles and whooping-cough	2	Vincent's angina	10
Vaginal discharge	3	Influenza	8
Whooping-cough and vaginal discharge	1	Erysipelas	6
		Cerebro-spinal fever	2
Tinea tonsurans	7	Tuberculous meningitis	4
Mumps	1	Puerperal fever	1
Scabies	3	Tetanus	1
Diphtheria	79	Enteritis	4
Ditto in combination with—		Erythema simplex	8
		Tonsillitis	14
Whooping-cough	8	Impetigo	7
Measles	6	Scabies	2
Chicken-pox	17	Albuminuria	1
Rubella	1	Bronchitis	2
Scabies	3	Faucitis	9
Measles and pneumonia	1	Urticaria	3
Vaginal discharge	1	Marasmus	1
Tinea tonsurans	1	Mumps	1
Typhoid fever	11	No obvious disease	12
		Total	482

TABLE II.—*Age Periods.*

Years.	Cases.	Years.	Cases.
Under 1	13	5 to 10	195
1 to 2	33	10 ,, 15	27
2 ,, 3	41	Over 15	36
3 ,, 4	59	Total	482
4 ,, 5	78		

TABLE III.—*Day and Week of the Disease on which Cases were Admitted, showing Combined Infections Separated Out.*

—	Day.							Week.			Total.
	1st	2nd	3rd	4th	5th	6th	7th	2nd	3rd	Over 3rd	
Scarlet fever	6	34	25	27	21	16	8	24	16	30	207
Diphtheria	2	31	22	24	13	8	3	19	17	35	174
Typhoid fever						1	1	9			11
Whooping-cough		2	4	2	1	3	1	11	1		25
Chicken-pox	3	5	2	3	2	3		7	1		26
Measles	7	11	13	7	2	2		6			48
Rubella	1	2	3		1			1			8
Mumps			1		1						2
Total	19	85	70	63	41	33	13	77	35	65	501

In all cases admitted to the hospital inquiry is made as to infectious diseases from which they have previously suffered. Although not always reliable, this information is very useful, and in Table IV. some idea is given of the number of patients in the ward protected by previous attacks of each of the common infections, according to the history obtained from the relatives.

TABLE IV.—*Disease before Admission.*

	Cases.		Cases
Measles	237	Rubella	13
Whooping cough	138	Scarlet fever	9
Chicken-pox	124	Mumps	6
Diphtheria	18		

In 179 cases there was no history of any previous infectious disease.

TABLE V.—*Cases under Treatment in the Ward on the Same Day.*

A.—On March 17th, 1920.	B.—On Oct. 7th, 1921.
Bed No.	Bed No.
1. Diphth. and ch'k'-pox.	1. Scar. fev. and wh'p'-cgh.
2. ,, ,, ,,	2. Scarlet fever.
3. Diphth. and scar. fev.	3. Tonsillitis.
4. Diphth.	4. Diphtheria.
5. Diphth. and wh'p'-c'gh.	5. Pneumonia.
6. Measles and br. pneum.	6. Scarlet fever.
7. ? Rubella.	7. Septic scar. fev.
8. ? Scarlet fever.	8. Tonsillitis.
9. Scarlet fever.	9. Vacant.
10. Vacant.	10. ? Scar. fev. and impetigo.
11. Enteritis.	11. Septic scar. fev.
12. Diphth. and measles.	12. ? Scarlet fever.
13. Vacant.	13. Erysipelas.
14. Diphtheria.	14. Pneumonia.
15. Br. pneumonia.	15. ? Scarlet fever.

Details of Various Series Treated.

Scarlet Fever.—207 cases of scarlet fever were treated, including three infected in the ward. In 106 cases scarlet fever was the sole disease, and of these 25 were of the septic type. It has been found that septic cases of scarlet fever do much better in this ward than in the main scarlet fever wards. This result I attribute almost entirely to free ventilation, the windows being kept wide open all the year round. Although these septic cases required constant treatment during the acute stage no cross-infection resulted from them. In 101 cases scarlet fever existed in combination with other diseases as shown in Table I. 137 cases were admitted during the first week of disease, and 70 at a later period.

The first case of cross-infection occurred on June 18th, 1919, and followed contact with a convalescent scarlet fever patient. The infected case was a boy of 7 years, convalescing from whooping-cough and occupying a bed at the end of the ward. The next bed was occupied by a girl of 7 years, in the fourth week of scarlet fever. Whilst up at the same time one afternoon, and sitting at their bedsides, they quarrelled; the girl rushed across to the boy's bedside and started fighting with him before the nurse on duty could reach them. Thirty-six hours later the boy developed a sharp attack of scarlet fever. The second occasion on which cross-infection occurred was in November, 1920, when two boys aged 4 years were infected. Both were diphtheria cases and occupied the cots on each side of the door of the sanitary annexe. One boy developed scarlet fever on Nov. 27th, 1920, and the other three days later. There were three cases of scarlet fever in the ward at the time, but I was not able to trace any definite source of the infection. Suspicion was cast on a nurse suffering from scarlet fever who occupied the side ward, and who was given the privilege of bathing in the bath-room after her third week of illness. To reach the bath-room, she had to go through the first half of the ward and pass between the cots occupied by the infected cases. She was never seen, however, touching either of these cases, and I am not certain that she was the cause of the infection.

Diphtheria.—174 cases were treated; in 79 diphtheria was the sole disease, in 95 it existed in combination, as shown in Table I. 103 cases were admitted during the first week of disease, and 71 at a later period. No secondary cases occurred.

Typhoid Fever.—11 cases were treated, 4 in the ward and 7 in the side ward. Two were admitted in the first week of disease, and 9 in the second week. No secondary cases occurred.

Whooping-cough.—25 cases were treated, the disease existing in combination in 22; 13 were admitted in the first week of disease. One case contracted whooping-cough in the ward. This was a mentally deficient girl, aged 8, suffering from scarlet fever; after the acute stage of scarlet fever was past she could not be kept in bed; on several occasions she got out of bed and ran round the ward. She was then transferred to a main scarlet fever ward where she developed whooping-cough five days later.

Chicken-pox.—26 cases were treated in the ward; most of these were transfers from the main wards where chicken-pox broke out on several occasions. Eight cases were admitted in the first two days of the disease; no cross-infection occurred. In the majority of cases the pocks were painted once a day, for the first three days, with a 2½ per cent. solution of picric acid. This was done as an experiment to try to get the pock to dry up quickly and thus reduce the infectivity of the disease. I am unable to say that any marked benefit was derived from the treatment, though it may have helped to prevent the spread of infection. I have recently become acquainted with the work on this subject conducted by Dr. F. H. Thomson, at the North-Eastern Hospital, and I hope at some future date to treat early cases of chicken-pox in the ward without any local application.

Measles.—48 cases were treated, including three infected in the ward; 31 were admitted in the first three days of the disease. The first case of cross-infection occurred when there was a severe epidemic of measles in the district, and the number of cases admitted to the ward rapidly increased. During the previous 2½ years, 25 cases had been safely treated in the ward, then, when the epidemic occurred, 23 cases were admitted in three months. The disease had broken out in two of the scarlet fever wards, and all the infected cases were transferred immediately to the bed isolation ward, several patients being admitted three days before the eruption appeared. The first case of the epidemic period was admitted on Feb. 13th, and by March 30th 17 cases had been treated. The first secondary case occurred on the latter date, and at the time there were 8 cases in the ward recovering from measles. On April 21st, two other secondary cases arose; at this time there were six measles patients in the ward. No definite cause of spread was discovered. The crowding of the ward with acute cases had certainly put the system to a severe test, but in view of the free ventilation, it

is difficult to imagine that the infection was air-borne. I am rather inclined to believe that it was carried by some vehicle such as feeding or nursing utensils or nurses' hands. The latter view is supported by the fact that there had been a change in the nursing staff shortly before the first secondary case occurred. There was a lot of sickness among the nurses in the hospital at that period, and several new nurses were drafted into this ward. From previous experience I have no hesitation in saying that at least one acute case of measles at a time can be safely nursed in this ward.

Except in the matter of age, no selection was made of the cases treated in this ward during the past three years. From an administrative standpoint the ward was found most useful and whenever there was a vacant bed in it any case which could not be treated in the common wards was sent there. As already mentioned, adults were nursed in the side ward, and only patients under 12 years were put into the main ward.

No difficulty has been experienced in the administration of the ward. It has always been in the charge of highly trained sisters who have been enthusiastic over the work and have taken their share in the nursing, with the probationers. The probationers soon pick up the threads of the work, and most of them greatly appreciate the training in this ward. Except that they can talk to each other, there is no communication of any kind between the patients, and I think this fact helps the nurses to realise the importance of all the details of isolation.

I consider free ventilation of the greatest importance in the success of the system. The windows are kept wide open day and night all the year round, and have been closed only on rare occasions through inclement weather. Last winter, for example, they were closed only on two occasions for a few hours on account of dense fog which was pouring into the ward. During the winter the patients are warmly clothed and supplied with hot-water bottles in their beds so that they do not suffer from exposure. The nurses also have to wear warm clothing in the winter. This free ventilation diminishes any risk of aerial conveyance of infection, and all septic cases do well in the ward.

In conclusion, I have to say that without this bed isolation ward at Plaistow Hospital, it would have been impossible during the past three years to have treated all the cases which required individual isolation.

References.—1. Rundle, C., and Burton, A. G. H.: THE LANCET, 1912, i., 720. 2. Thomson, F. H., and Price, C.: THE LANCET, 1914, i., 1669. 3. Thomson, F. H.: THE LANCET, 1916, i., 341.

OPERATION FOR REMOVAL OF LIVING EXTRA-UTERINE CHILD AT FULL TERM.

BY E. OCTAVIUS CROFT, M.D. DURH., M.R.C.S. ENG.,

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THE following case of extra-uterine pregnancy, with infant delivered alive at full term, is interesting.

History.—The patient, aged 33, sent to me by Dr. H. B. Pare, of Wakefield, was admitted into the Hospital for Women, Leeds, on Nov. 5th, 1921. She had been married 11 years and there had been no previous pregnancy. The last regular period took place in February, 1921. In April she suffered from painful and difficult micturition with severe pain in the lower abdomen. She remained in bed for two months. In June there was a severe attack of abdominal pain with constipation and slight jaundice which suggested gall-stone colic, and she was again confined to bed for some weeks. About the end of July, on getting up, she had some vaginal bleeding for one day. The show was repeated a month later, and again in three weeks. During the subsequent 10 weeks before admission there had been no bleeding. The abdomen had gradually enlarged from February and the patient had noticed the enlargement more particularly since the attack of colic in June. There had been a little œdema of the legs during the last two months. Micturition remained frequent and there was troublesome constipation throughout.

Condition on Examination.—The breasts showed the usual signs of pregnancy. The abdomen was irregularly enlarged to a size corresponding to about the eighth month of pregnancy. The outline of the pregnant uterus could not be defined on palpation. A rounded mass upwards and to the right of the umbilicus suggested the presence of a fœtal head and other large nodules resembled fœtal limbs. A hard mass was felt in the mid-line rising from the pelvis. A loud souffle could be heard over the left lower region of the abdomen. The presence of the fœtal heart sounds was not definitely established.

Vaginal Examination.—The vaginal axis was displaced forwards and the cervix was drawn upwards and forwards behind the symphysis pubis. A firm mass was traced upwards from the cervix anteriorly. Posteriorly a large, solid, roundish mass occupied the pelvis, pressing on the rectum behind and causing the anterior displacement of the vagina and cervix.

Operation (Nov. 8th).—Preliminary examination under ether revealed more definite evidence of the fœtal parts and also the presence of the fundus uteri rising a little way above the pubes. The abdomen was at once opened by a long paramedian incision. From the lower end of the wound a bulging swelling appeared, resembling the bladder. The passage of a catheter and the relations of the round ligaments proved this to be the uterus, very soft and enlarged to about double its non-pregnant size. As the operation proceeded the uterus became firmer and smaller by contraction. A large irregularly lobed swelling occupied the greater part of the abdominal cavity, extending and being more fixed towards the left. The hand could be passed between the tumour and the abdominal wall, on the right side, to the pelvic region, and through the thin cystic wall of this part of the sac the fœtal parts could be felt; the head above, the limbs to the front, and the breech below in the pouch of Douglas. On the left side the hand could be passed between the sac and the abdominal wall to the iliac fossa but no farther. The soft mass of the placenta was defined as attached to the structures of the pelvis, on this side, in the situation of the iliac vessels, ureter, and base of the broad ligament up to the side of the uterus. The proximal part of the left Fallopian tube could be traced for about half an inch from the uterine cornu to be lost on the sac wall. The much-displaced infundibulo-pelvic ligament could be identified towards the upper and back part of the sac. The right hemisphere of the sac was thin and transparent, apparently only consisting of fœtal membranes. A portion of the left side of the sac was formed of the remains of the left tube and broad ligament. The sac was opened to the right well clear of the placenta and a loop of pulsating funis at once escaped with liquor amnii. The child was removed rapidly. It was apnœic, but respiration was soon established by the usual methods. It was free from obvious malformation, perfectly developed, and mature although small. Weight about 5 lb., sex male. About fifth day some hæmatemesis and melæna and the infant died. Autopsy was not available.

Examination of the sac revealed the placenta as expected mainly attached to the subperitoneal pelvic structures, its anterior edge extending a short distance forwards on the freer portion of the sac. It was obviously impossible to remove the placenta in view of the danger to the subjacent structures and the difficulty of ligaturing the vessels. The cord was ligatured and cut off short, the stump being dropped into the sac. The sac was marsupialised by suture to the lower angle of the wound, and the cavity loosely packed with gauze. The remainder of the abdominal wound was closed as usual.

The pregnancy appears to have originated in the left Fallopian tube with erosion and extension into the broad ligament and subsequent perforation of the posterior layer of the broad ligament into the peritoneal cavity, the fœtal membranes having remained intact.

Progress.—There was some shock, the pulse keeping at about 120 for a few days. The temperature rose to about 100° F. on the fifth and eighth days. There was only slight oozing from the wound and the packing was gradually lessened. On the sixteenth day the sutures were removed; wound healed except at the drain. On the twenty-seventh day the temperature rose again. The remains of packing were removed; some offensive discharge and small portions of placenta escaped and the temperature fell. The cavity was irrigated from time to time and small fragments removed. On Jan. 17th (the seventy-first day) under ether, the drain hole was enlarged to admit the finger and the remaining mass of placenta being felt lying loose in the cavity was extracted, the cavity freely irrigated, and a large tube inserted. The temperature rapidly subsided and the sinus quickly healed after removal of the tube. The patient was discharged quite well.

Remarks.

The case operated on by the late Mr. T. R. Jessop[1] in Leeds in 1876 is a classical one; the child lived

[1] Trans. Obst. Soc. Lond., vol. xviii., 1876.

about a year when it succumbed to pneumonia. The late Mr. Gordon Ley[2] in his valuable paper on full-term ectopic pregnancy, collected records of 20 cases of operation at term, the child being alive. Of these infants 54·5 per cent. were well-developed, 45·5 per cent. were malformed, and 18 per cent. died shortly after delivery. The maternal death-rate was 27 per cent. As to the treatment of the living placenta—undoubtedly if it is situated in such a position with relation to its sac that the vessels can be ligatured, the sac and placenta removed, this is the ideal treatment, but if, as in my case, this is impossible, marsupialisation, with packing and drainage, is the safest method. Closure of the wound without removal of the placenta is not at present a method to be relied upon for safety. In the case reported by the late Dr. Jas. Braithwaite[3] the placenta did not come away; 19 years later Dr. J. B. Hellier[4] reported an autopsy on the same patient which showed that there were no evidences of the placenta then remaining.

Leeds.

FOURTH DISEASE OR PARA-SCARLET?

BY K. SIMPSON, M.D. EDIN., M.R.C.P. LOND.,
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DURING a period of 18 months, 812 cases admitted to the Croydon Borough Hospital for Infectious Diseases—notified either as scarlet fever or as observational cases in which the diagnosis of scarlet fever was doubtful—were carefully reviewed, with the object of eliciting whether there were sufficient or any grounds for concluding that a fourth exanthem, as such, did actually exist apart from scarlet fever, measles, and rubella. In this way all cases of exanthem were sufficiently observed to justify a positive opinion one way or another, and the results obtained—with the single exception of a series of cases hereinafter referred to, met with during January and February, 1921—differed in no wise from the findings of most authorities on the subject, that any evidence for the existence of a fourth disease, as such, is in the present state of our knowledge so far of a negative character. Among cases originally notified as scarlet fever apart from two teething rashes in infants, 14 cases proved to be rubella, 1 secondary syphilis, and 1 gonococcal rheumatism accompanied by a rash. Sixteen cases of doubtful exanthem sent in for observation proved to be made up as follows: 7 scarlet fever, 6 rubella, 1 mixed infection of scarlet fever and rubella, 1 measles, and 1 encephalitis lethargica complicated with a scarlatiniform rash.

Towards the middle of January, 1921, a series of cases were observed somewhat resembling scarlet fever as occurring in a diphtheria ward accommodating 35 female patients. The first case was noticed by a nurse reporting desquamation on the hands and feet of a convalescent diphtheria patient, resembling somewhat that met with after scarlet fever. The patient was isolated, and the usual precautions observed on the assumption that scarlet fever had been introduced into the ward. Fifteen subsequent cases, occurring in the same ward, were segregated in a small separate ward, whereby it was possible to observe their clinical course throughout. About the same time at least 13 similar cases were discovered amongst admissions to the scarlet fever wards notified as suffering from that disease, and who, although subsequently treated with scarlet fever cases, did not contract the latter infection, assuming that they differed in any way from scarlet fever, or might have been examples of the so-called fourth disease or other exanthem. From those cases which occurred amongst convalescent diphtheria patients the incubation period of the affection would appear to have been about three days, distinguishing the condition thus from rubella and also from the so-called fourth disease, where the incubation period has been stated to be about 15 days.

[2] Proc. Roy. Soc. Med., Obst. Sec., vol. xii., 140, 1919.
[3] Trans. Obst. Soc. Lond., vol. xxviii., 1886.
[4] Journal of Obst. and Gynæcol., vol. v., p. 441.

Symptoms.

The onset of the disease resembled scarlatina in its acuteness, except that vomiting as an initial symptom was only noticed in one case. Coincidently with the onset, which was marked by feelings of malaise, headache, and slight sore-throat, the temperature was found to be elevated from 100 to 101° F., while the pulse-rate was usually 90 to 100 per minute. Headache was a pronounced symptom. Sore-throat, in the sense of the acute sore-throat of scarlet fever, was not a pronounced symptom, complaint with reference to the throat being rather that of a dull pain, the result of congestion of the fauces, rather than that of inflammation and presence of the enanthem usually found on the examination of scarlet throats. Adenitis was little marked and usually limited to the submaxillary glands, the conjunctivæ were never suffused, stiff neck not complained of, nor was such widespread adenitis found as one meets with usually in rubella.

Nature, Position, and Duration of Rash.

Coincidently with onset the exanthem appeared during the first day of illness upon the sides of the neck, extending some little distance upwards upon the cheeks, the remaining parts of the face not being involved, apart from, in some cases, a certain amount of puffiness about the eyes. Circumoral pallor was not a noticeable feature. The rash lasted on an average about 12 hours, the longest period recorded being about 36 hours, and while present showed a more uniform and erythematous involvement of the cutaneous tissues than does scarlatina. Punctation of the rash, apart, perhaps, from the flexures of the limbs, was very poorly marked, and appeared to be replaced by a diffuse erythema resembling rather the flush of the scarlatinal cheek than the rash as usually noticed on the body. In colour the rash was of a bright rosy red, contrasting with the deeper scarlet of scarlatina or the faded pink of rubella. In distribution the rash appeared to involve certain areas of the body—for example, the abdomen, chest, and upper extremities, whilst sparing the lower. The tongue appeared almost at the beginning of the illness covered with a thick creamy-white fur, which gradually cleaned but without peeling or ever reaching the typical raspberry stage of scarlet fever, and contrasting thus strongly with what is probably the most diagnostic feature of the latter disease. About the third or fourth day of illness, desquamation was observed on the lobes of the ears and upper sides of the neck, of the pinhole or scarlatinal type, but as far as could be observed peeling for the time was confined to these areas. Towards the middle of the second week, instead of in the fourth as usually seen in scarlet fever, peeling—again of the scarlatinal type—was noticed, involving the hands and feet, but no other part of the body.

Convalescence was throughout uninterrupted and without mortality, even amongst diphtheria patients, and without any of the complications incidental to scarlet fever. No further desquamation, other than the limited variety referred to above, was ever noticed throughout the illness, in any of the cases kept under observation.

Temporary Immunity against Scarlatinal Infection.

From a review of the foregoing facts, the series of cases alluded to cannot be said to furnish proof of a decisive nature that a separate fourth exanthem exists, but rather, as regards present experience, of a mild but distinct type of scarlet fever, mild in view of its freedom from any of its usually associated severities, and distinct in view of the immunity, temporarily conferred at least, against subsequent scarlatinal infection. Evidence points strongly in favour of the type of illness described as bearing some such relation to scarlatina as alastrim does to

small-pox, where the one affection appears to convey a certain amount of immunity against the other, due in all probability to the possession of some one antigen common to both. The substitution consequently of the term "para-scarlet" for the series of aberrant scarlatinal types detailed rather than fourth disease, would be justified on the same grounds as that of the term para-small-pox for the already misleading one of alastrim or amaas. There would seem, finally, little or no justification for including the above series of cases as falling within the province of rubella any more than within the hazy and ill-defined boundaries of a so-called fourth disease, whilst the distinctness of the type from ordinary scarlet fever is practically certain.

Although it is not pretended that the foregoing remarks are at all exhaustive of the several exanthematous conditions which have from time to time been described under the name of a fourth disease, it yet seems justifiable to conclude that mild scarlet fever, possibly, and as suggested of the nature of a para-infection, may be responsible for many instances of an exanthematous outbreak resembling scarlet fever but described as a "fourth infection."

My indebtedness is due to Dr. R. Veitch Clark, medical officer of health for this borough, for permission to refer to the above cases.

CORRIGENDA.—In Dr. David Nabarro's Bacteriological Report on 41 Fatal Cases of Epidemic Diarrhœa, which appeared on p. 325 of last week's issue of THE LANCET, under Method of Isolation "Nebipelagor" should read "rebipelagar." The penultimate sentence in the next paragraph should read: "Adding these together we find that *B. coli anaerogenes* was isolated from 12 cases, *B. dysenteriæ* from four, *paratyphosus* B indol negative from three, *paratyphosus* B-type indol positive from two, *B. proteus* from two, and an unidentified bacillus from one case." In the sixth line from the end of the report "indol, usually acid" should read "usually *absent*."

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

A CASE OF SPONTANEOUS SHORT CIRCUIT.

BY E. C. BEVERS, M.B., B.CH. OXF., F.R.C.S. ENG., F.R.C.S. EDIN.,

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THE following note of a case of ulceration of a carcinoma of the colon into the small intestine producing a short circuit, is of interest.

The patient, a male aged 65, was admitted to the Radcliffe Infirmary on Jan. 24th, 1920, complaining of a lump which he stated moved about in his abdomen. He was a short, stout man whose health had been good until a year previously, when he began to suffer from constipation and lost weight to the extent of 2 st., his waist measurement being diminished by 9 inches. For nine months he had been forced to take large doses of aperients, then diarrhœa set in, and for the last three months his bowels had been open six to eight times in the day, the stools often being very dark. He had experienced no pain, and there had been no vomiting, but nine months previously he first noticed in his epigastrium a swelling the size of a walnut, which gradually increased in size; he also noticed that it moved about to different parts of the abdomen. He complained of a little difficulty in micturition, and stated that he had passed a stone from his bladder three years ago.

Condition on Examination.—Although the patient was a well-fleshed man who had obviously lost a good deal of weight, there was a large hard mass to the left of the umbilicus which could be moved slightly in an up-and-down direction, and also from side to side, but did not move on respiration. On handling it a gurgling noise could be heard suggesting the passage of fluid and gas through the mass. On examination a few days later the mass was a little below and to the right of the umbilicus, and could be moved from side to side. There was some enlargement of the prostate which accounted for the difficulty in micturition, and the urine contained a faint trace of albumin. Cystoscopic examination showed both ureteric orifices to be normal, and similar urine was obtained from both kidneys. The result of a barium meal was rather puzzling; the meal passed in a normal manner through the stomach, after which large masses of barium could be seen down the left side of the abdomen and in the pelvis, but no barium appeared in the cæcum or ascending colon. The diagnosis made before operation was carcinoma of the pelvic colon, but we were unable to explain the appearances seen after the barium meal; after the mass had moved to below the umbilicus the left kidney could be palpated, and this fact, together with the cystoscopic findings, excluded the renal condition at first suspected.

Operation.—A large malignant growth of the pelvic colon was found. To it adhered two separate coils of small intestine. Eighteen inches of pelvic colon with a mass of glands in the mesocolon, and also 2½ feet of small intestine were resected, end-to-end anastomosis being performed in each case. The patient made a good recovery and was discharged from hospital on March 6th, 1920. At the date of writing (June, 1922) he has put on a good deal of weight and is very well.

Remarks.

The growth on section was a columnar-celled carcinoma, which had ulcerated into the first loop of adherent small intestine, so that there was an anastomotic opening between the two with a diameter of an inch. The second loop of small bowel was adherent to the growth, but there was no communication between it and the big bowel. The result of this condition was that practically the whole of the contents of the small intestine, from a point about five feet above the cæcum, was passing straight into the pelvic colon; there were many adhesions between the two loops of small intestine concerned, and the bowel distal to the anastomosis was very contracted, so that little could have passed by the natural route. The anastomosis must have formed about three months before the patient's admission to hospital, when marked constipation was followed by diarrhœa. It is remarkable that he should have experienced no pain or vomiting during this ulceration. The condition found at operation explained the curious picture after the barium meal, the barium passing straight from the small bowel into the large.

I have had one other case of malignant disease of the colon, where there was no doubt that a short circuit had taken place between the growth and the small bowel. In this case I performed a colostomy for an inoperable carcinoma of the lower part of the pelvic colon; the colostomy served its purpose for about a year, after which I was informed that the patient had begun to pass frequent liquid motions through the anus. On examination I found a well-marked spur; the motions passed contained a certain amount of undigested food, and I was puzzled to explain how they had passed over the spur and reached the anus. The distal opening of the colostomy was plugged so that nothing could pass, but the motions still went on, and I have no doubt in my mind that here also there was an anastomosis between the growth and an adherent coil of small intestine.

A CASE OF DIPHTHERIA

COMPLICATED BY HEMIPLEGIA WITH APHASIA.

BY H. GORDON SMITH, M.B., B.S. LOND., D.P.H. CAMB.,

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THIS case presents unusual features which seem to be worthy of consideration.

The patient, a well-nourished girl of 6, developed on Nov. 27th, 1921, symptoms suggestive of diphtheria. She was seen by a private practitioner, who gave her antitoxin and swabbed her throat. The diagnosis of diphtheria was confirmed by a "positive swab." On Dec. 3rd the child was admitted to the Shrewsbury and Atcham Joint Isolation Hospital; on admission her throat was red only. The apex

beat was within the nipple line, the heart sounds were clear, and the pulse-rate varied between 80 and 112.

The patient's condition was quite satisfactory until the 11th, when a nasal voice developed, and there was slight difficulty in swallowing. On the following day the child vomited several times and became a little cyanosed; the pulse-rate increased, but there was no irregularity. In the course of 48 hours the vomiting ceased and the general condition improved daily until the 19th. On this date the night nurse who went to the patient in the morning found her speechless and partially paralysed. On further examination I found that the right arm and leg were completely paralysed, and the right side of the face partially so; the child could hear but was unable to speak.

Although the hemiplegia developed soon after the diagnosis of palatal paralysis, it was obvious that a diagnosis of peripheral paralysis would not explain everything. Presumably it was a question of embolism or thrombosis. Apart from the cyanosis there was nothing to draw attention to the heart. The child had previously suffered from measles and whooping-cough, but had had no other illness and had been examined previous to the incidence of diphtheria by at least two doctors, who had pronounced her perfectly healthy. During the attack of diphtheria the temperature varied slightly, and at no time rose above 98° F., so that sepsis can have contributed little, if at all, to the condition.

The patient was discharged on Feb. 23rd, approximately three months after the commencement of the illness. She could then walk with difficulty, having partially recovered the use of her leg and had regained some power in her arm. The child could only speak a few short sentences, but her speech was improving slowly. Her heart was normal.

Reviews and Notices of Books.

L'HÉPATISME.

Par le Dr. ROGER GLÉNARD, ancien interne des hôpitaux de Paris, médecin consultant à Vichy. Paris: L'Expansion Scientifique Française. 1922. Pp. 460. Fr.30.

Frantz Glénard was born at Lyon in the year 1848. By both his parents he was related to famous chemists and it was natural enough that he should have adopted medicine as a profession. He had finished the first three years of his studentship when the war of 1870 broke out, and he had not long been at the front before he was, with many others, made prisoner. In contrast to the experience of most medical prisoners in the late war, Glénard was placed under the charge of a humane and enlightened German physician named Brand, from whom he learnt much, and whose treatment of typhoid fever by hydrotherapy marked a great advance in therapeutics; this treatment Glénard, who always bore testimony to the high character of Brand, successfully introduced in France when he subsequently returned to Lyon. Passing on to the schools of Paris, he qualified in medicine and published several remarkable researches, but ill-health obliged him to abandon a promising academic career, and it was only after some years of rest that he was able to resume his work, going to Vichy in 1882 and remaining there for the greater part of his life. It was at Vichy, in 1885, that Glénard brought out his work on visceroptosis, and it was at the same resort that he carried on for years the observations which led him to put forward the theory of hepatism to which the present volume is devoted. We have glimpses of him in these pages during the periods of his life which he most appreciated, the long winters when he devoted himself to study, living almost a hermit's life, surrounded by his books and the detailed notes of thousands of his cases. In the summer he would return to his clinic, apparently as an eminently successful practitioner, but really as a scholar collecting further data for the next winter's work. There is tragedy in the thought that to this man, in his old age, at the end of a career achieved by much struggle with adversity, there came again the clash of war. From the first days, in 1914, we read that for him there was but one thought—his country; and the long years of strain wrought their effect, so that when victory came it came for him too late, and in May, 1920, worn out by past anxieties, mourning the loss of wife and friends, he died.

In this book, written by his son, will be found a full account of Glénard's views. He dealt with a class of patient not seen in the general hospitals, persons usually of wealth, seldom acutely ill. They would not have been qualified for hospital treatment, nor did they require treatment in an institution. But in them he was able, year after year, to trace the gradual development of organic disease such as cirrhosis of the liver, diabetes, gout, renal disorders, or cholecystitis, and from his notes of the changes in their physical signs he evolved the belief that it was disordered function of the liver that caused the majority of these maladies. Glénard evolved a special technique for abdominal palpation, more especially for palpation of the liver, "le procédé du pouce," and there can be little doubt that his clinical observation was thereby greatly enhanced; it is equally certain that no dramatic anatomical changes can be expected in cases such as these which exhibit the earliest symptoms of disease.

These facts should make even the sceptic hesitate before dismissing the author's conclusions, and we feel that the growing numbers of clinicians who seek for further light on the disorders of metabolism will find inspiration in this book, which sets out the views of a pioneer and an enthusiast.

CHOLELITHIASIS.

La Lithiase Biliaire. Second edition. By A. CHAUFFARD, Professeur à la Faculté de Médecine de Paris, Médecin de l'Hôpital St. Antoine.

THIS is a complete and exhaustive study from the physician's aspect of this disease. It gives evidence of long experience and careful clinical observation, but although the essentially clinical point of view taken by the author is perhaps the most interesting aspect of the work, experimental and laboratory investigations both by himself and others receive due notice.

The cause of the condition of cholelithiasis is first considered from the clinical and experimental aspects, and the rôle of infection and of faulty secretion of cholesterine (the humoral origin of the disease as the author names it) are discussed in detail. The characters of biliary calculi and their classification, and the symptoms and pathological lesions caused by them are described, while a chapter on radiography as applied to gall-stone disease is of great value and interest. The diagnosis in cases of cholelithiasis is dealt with clearly under the headings diagnosis of disease, diagnosis of the position of the stone or stones, and the associated changes in the affected organs. A separate chapter is given to the subject of gall-stone ileus, and while the description of the symptoms and of sequence of events is good two points may be criticised. First, it is not the general experience of surgeons that the site of arrest of a gall-stone in the intestine and of the consequent obstruction is always the small intestine; several cases have been seen of impaction in the pelvic colon. Secondly, we take strong exception to the statement that in any case of acute intestinal obstruction a delay of four days (p. 190) is good; Prof. Chauffard gives many examples of the possibilities to which such a delay may lead, and while we agree with his opinion that it is better to operate too early than too late, we differ from him as to the meaning of these terms. The last part of the book is devoted to treatment, under the three heads of "dietetic and medicinal," "mineral water treatment," and "surgery." The first two aspects are dealt with in great detail and for us in England, where water cures are not generally well understood, the chapter devoted to them is interesting and instructive. The advice to the "excitable" Frenchman to have recourse to the less

active waters of Vichy, while the well covered, heartily eating German is sent to the more stimulating waters of Carlsbad is admirable. Travellers to these waters are advised to take a slow (and therefore less shaky) train, and it is small points of practical interest like these which give us the benefit of the author's extensive experience.

The author is not an enthusiast over surgical treatment of gall-stones. This is not to say that he never approves of it; on the contrary, he gives indications in which he considers surgical treatment a necessity, and with these we cordially agree. We also agree that operative treatment "cures the patient but not the disease" and that medical measures should follow to complete the cure if possible. But will not medical treatment for the general condition usually be more efficient and more permanent, if the local condition is dealt with and if possible eliminated? Further, the author tells us that many patients can be so improved without surgery that acute attacks of colic become rare, and that the general condition is greatly ameliorated. Still, such treatment condemns the patient to prolonged dietetic, medicinal, and hydro-therapeutic treatment, and after all leaves him with the possibility of future symptoms and liable to the risks of the serious complications described graphically by Prof. Chauffard.

the book as a whole is instructive. It is, moreover, well written and well printed, and the plates are carefully chosen and reproduced. An index would be a valuable addition.

POST-GRADUATE MEDICINE.

Prevention and Treatment of Disease. By AUGUSTUS CAILLÉ, M.D., F.A.C.P. London and New York: D. Appleton and Company. 1922. Pp. 1023. 40*s*.

THIS book, which is written for the practitioner and advanced student, is disappointing. The ground covered is extensive, and in the text the author has not kept to the subject of his title. Prophylactic measures are dealt with mainly on the lines of a household manual, and, considering Dr. Caillé's extensive experience in teaching and in practice, more definite notes of treatment on lines that he himself had found of therapeutic value might have been expected. The book contains much that is useful, but could be greatly condensed. The illustrations are particularly good.

A SYSTEM OF CLINICAL MEDICINE.

Sixth edition. By THOMAS DIXON SAVILL, M.D. Lond. London: Edward Arnold and Co. 1922. Pp. 951. 28*s*.

THE sixth edition of this work maintains the high standard of former editions. The whole book has been thoroughly revised by experts in the different sections, and various additions and changes have been introduced, among the more important being short accounts of encephalitis lethargica, anaphylactic phenomena, the various tests used for renal efficiency, the treatment of renal disease, vitamins, and deficiency diseases. The book gives valuable aid in the diagnosis of disease from main symptoms, and makes a special appeal to the senior student.

PHYSICAL EXAMINATION OF THE CHEST.

With Special Reference to Pulmonary Tuberculosis, including a Chapter on Tuberculosis of the Larynx. By JAMES CROCKET, M.D., D.P.H., M.R.C.P. E. London: H. K. Lewis and Co., Ltd. 1922. Pp. 254. 9*s*.

To learn the art of physical diagnosis in diseases of the chest has always been one of the most difficult parts of a student's training. Dr. Crocket understands the difficulties, and has put a wealth of clinical and teaching experience into a book on the physical examination of the chest. The chapters on inspection, palpation, and percussion have been developed with great thoroughness, and emphasise the fact that "long before the stethoscope tells us anything, percussion, palpation, and even inspection may indicate that the lung tissues are involved." The chapter on auscultation deals with the breath sounds in health and disease, and it is stimulating to the student to be reminded once again that the first stethoscope, invented by Laënnec in 1816, consisted of a quire of paper rolled "into a kind of cylinder and applied to the region of the heart." A good description of the surface anatomy of the thorax is given, and an excellent scheme for the classification of pulmonary tuberculosis. The book is completed by chapters on X rays in diagnosis, graphic records in chest examination, and the examination of the larynx; the whole is of handy size and well illustrated by sketches and photographs.

We can confidently recommend this volume as a valuable guide to the examination of the chest, particularly for the student about to enter on his first medical appointment.

DISEASES OF INFANCY AND CHILDHOOD.

Eighth edition, fully revised. By L. EMMETT HOLT, M.D., Sc.D., LL.D., formerly Professor of Diseases of Children, Columbia University; Physician in Chief to the Babies' Hospital, New York; and JOHN HOWLAND, A.M., M.D., Professor of Pediatrics in the Johns Hopkins University, Baltimore, and Pediatrician in Chief to the Hospital. London and New York: D. Appleton and Co. 1922. Pp. 1127. 35*s*.

THE new edition of this well-known text-book has been brought thoroughly up to date; new articles have been written upon vitamins, encephalitis lethargica, and food idiosyncrasies; many other chapters have been re-written in the light of recent advances, and the illustrations have been revised, many new plates being added. It is hardly an exaggeration to say that no better medical text-book exists in our language. The matter is admirably arranged, and the authors deal with their subject in a spirit of lucid criticism which must commend itself as much to the student as to the experienced physician.

LA RÉACTION DU BENJOIN COLLOÏDAL.

Les Réactions Colloïdales du liquide céphalo-rachidien. By GEORGES GUILLAIN, Professeur agrégé, GUY LAROCHE, Médecin des Hôpitaux, et P. LECHELLE, Ancien interne des Hôpitaux, Paris. Paris: Masson et Cie. 1922. Pp. 146. Fr.12.

A SMALL and practical handbook dealing with reactions and tests of the cerebro-spinal fluid that have come into vogue since the establishment of the Wassermann procedure is sure to be welcome. The tendency of recent work in this department of pathology is towards the simplification of technique, always with the proviso that nothing be lost in trustworthiness. Among the newer methods the reactions with colloidal gold, gum-mastic, and colloidal benzoin deserve particular mention; the last of these was the discovery of the authors of this brochure, and for ease of working and certainty of result it possesses advantages over the others. A place will be found for this little manual on the bookshelf of every clinical pathologist.

INTENSIVE TREATMENT OF SYPHILIS.

Intensive Treatment of Syphilis and Locomotor Ataxia by Aachen Methods. With notes on Salvarsan. By REGINALD HAYES, M.R.C.S., &c. Fourth edition, revised. London: Baillière, Tindall and Cox. 1922. Pp. 99. 4*s*.

THE fourth edition of this useful book differs in little from its predecessors, which have been favourably reviewed on previous occasions; some clinical records have been brought up to date, modification in previous accounts of salvarsan administration has been effected, and there are minor alterations in nomenclature. The book still remains as the best advocate of the mercurial inunction procedure we know, a method for the treatment of syphilis and neurosyphilis that has not been weakened by the discovery of newer and more highly vaunted remedies.

SYPHILIS, PALUDISME, AMIBIASE.

By PAUL RAVAUT. Paris: Masson et Cie. 1922. Pp. 210. Fr.9.

THIS book upon three of the most prevalent and intractable diseases which afflict mankind forms one of the practical medical and surgical series now being published by Masson and Co.

In the preface to the work Prof. Widal points out the curious fact that in each of these widely prevalent diseases a specific drug—mercury, quinine, ipecacuanha—has been applied on an empirical basis long before the actual germ causing the disease was discovered, and it may be fairly claimed that their exact action is not even yet properly understood.

The subject-matter in the book is devoted mainly to treatment, and is based for the most part on conclusions drawn by various French workers on these diseases during the war. The various drugs and combination of drugs which have from time to time been advocated are treated with a detailed consideration which from the English point of view may seem over-elaborate, especially when the evidence of their efficacy is at present doubtful or undetermined. Under amœbiasis, for instance, the various methods of exhibition of ipecacuanha, emetine, and arsenic by the buccal, intravenous, or intramuscular routes is fully discussed. A full bibliography culled entirely from French literature is attached. The book undoubtedly should supply a want at the present moment, but it is regrettable that the review of treatment is so impersonal. It would have been more useful had the author selected any one line of treatment and concentrated on its advantages.

A MIND THAT FOUND ITSELF.

Fifth edition. By CLIFFORD WHITTINGHAM BEERS. London and New York: Longmans, Green and Co. 1922. Pp. 368. $1.90.

THIS work has become a classic. It is the autobiography of a man who for some years was insane, and the main effort for lunacy reform in the United States during the last ten years is the direct result of its publication. Faultless in style and unique in interest, it may be read profitably by anyone, but its main value is to those who have to deal with the insane. There exists no other such description of a case of manic-depressive insanity. The author's perfect memory and his facility in tracing the contents of his mind throughout the three years of his illness seem to lay bare the morbid process almost to its foundations. Particularly illuminating are the examples of the mechanism by which his delusions developed; the most trivial causes originated them; equally trivial and avoidable circumstances may be a source of terror to such patients—a loudly ringing bell or a chance ambiguous remark—and the care which is necessary to avoid these effects is nowhere so clearly illustrated as in this narrative.

For the general reader and the biased "reformer" the book has many pitfalls. Nothing is more characteristic of this type of insanity than officious and baseless accusations made against attendants and medical officers. Of such there are many examples in the book, and it is justifiable to conclude that a large proportion of them were symptomatic. There remain some which are probably just. Mr. Beers undoubtedly suffered inconsiderate treatment from several individuals in whose care he was placed. He complains of systems and rules, but his main plea is for patient and unfailing kindness on the part of all the staff. An American psychiatrist expressed this feeling for him by saying, "After all, what the insane need most is a *friend*."

The present edition includes a long account of the development and work of the National Committee for Mental Hygiene, of which the author was the original organiser and is now the secretary. Room has been made for this by deleting propagandist sections formerly interspersed in the narrative, "the purpose of which," we are glad to hear, "has now been served."

PNEUMONIA.

By FREDERICK TAYLOR LORD, A.B., M.D., Visiting Physician, Massachusetts General Hospital. Cambridge: Harvard University Press. 1922. Pp. 69. 4*s*. 6*d*.

THIS little monograph is one of a series of booklets published under the title of Harvard Health Talks. It contains the substance of a popular Sunday afternoon lecture delivered at Harvard Medical School with the aim of "setting forth in non-technical terms our present knowledge about pneumonia, with suggestions for prevention and treatment." To those who have suffered many things from the usual type of popular lecture this health talk will come as a happy relief. Indeed, the word "popular" used by the publishers themselves on the cover of the book conveys only a faint idea of the scope of the monograph. It is, in reality, an accurate account of the disease suitable for perusal by an educated layman who desires the most up-to-date knowledge on pneumonia. The book contains a succint account of big pneumonia epidemics, such as those of the Panama canal, the Rand mines, and the war-time camps of America. There is also a short history of the bacteriology of the disease, in which the question of priority of discovery is fairly dealt with.

The researches of the Rockefeller Institute on the "typing" of the organism, the work of Wright and Lister on prophylactic inoculation in natives in South African mines, and the treatment with antiserum are all set forth clearly in simple non-technical language. And throughout the author has kept in the foreground of his picture the infective nature and the specific immunological characteristics of the disease so that the careful reader is not likely to hand on old wives' tales about causation. At the same time, in the paragraph dealing with predisposing causes, the author has put a right emphasis on overcrowding, age, alcohol, and other factors. If all the Harvard Health Talks reach this high standard the level of general education should be raised by their issue.

HINTS TO PROBATIONER NURSES IN MENTAL HOSPITALS.

By RICHARD EAGER, O.B.E., M.D.Aberd. London: H. K. Lewis and Co., Ltd. 1922. Pp. 80. 1*s*. 6*d*.

THIS handbook consists of two distinct parts, a statement of elementary rules and ward duties, and an outline of psychology. There is little to criticise in the first part of the book. In giving the list of articles required for tube-feeding it would be well to include a tumbler of water. It is a common practice to introduce water before any food is given, as a safeguard against the introduction of food into the trachea when insensitive or stuporose patients are being fed. If the sterilisation of catheters be described at all, it should be done more fully and its rationale explained. Nothing is less satisfactory to an intelligent person than dogmatic rules without explanation, and the information given in this instance is so incomplete as to be positively dangerous. Although the prevention of bedsores is discussed, the necessity from this point of view of changing a patient directly he is wet or dirty is not mentioned. With these few exceptions, however, this part of the book is excellent. It can be read in 20 minutes, and leaves a clear impression of the nature of a nurse's duties, and of the elementary rules, common to all mental hospitals, designed to ensure the patient's safety.

The second part of this handbook is an attempt to present Freudian psychology in limited space and simple language. In this the author is partly successful, but he has occasional lapses, in one of which he remarks—"The conscious mind is educated, the unconscious uneducated and uneducable, non-moral and entirely egocentric." The vocabulary is mostly there; conflict and complex, rationalisation, projection, dissociation, symbolism, and so on. The feat of

compressing such a volume of theory into 44 more or less intelligible pages is no mean one. But its relation to the duties of a nurse in her first year is remote in the extreme. An outline of the main types of insanity, and of the peculiarities in behaviour of patients suffering from them, particularly if expressed in the author's remarkably vivid and direct style, would have been more useful. The place for academic psychology is in the larger text-books used by the nurse in a later stage of her training.

FUNCTIONAL NERVOUS DISORDERS.

Their Classification and Treatment. By DONALD E. CORE, M.D., M.R.C.P., Lecturer in Neurology, Victoria University of Manchester, &c. Bristol: John Wright and Sons, Ltd. 1922. Pp. 371. 25*s*.

WE cannot but demur to the title selected by the author of this erudite, if somewhat unsatisfactory contribution to a question occupying much attention at present, seeing that the subject-matter deals almost entirely with hysteria and with what are called for the purposes of the work, the "instinct-distortion neuroses" and the "mnemoneuroses." Numerous functional nervous disorders, complying with the author's definition of being undetermined by any gross or demonstrable pathological lesion, or at least usually considered by neurological opinion to be functional, are not so much as mentioned, still less described. We recognise Dr. Core's legitimate right to make a classification for himself and to justify his terminology as best he may, but his title arouses a pleasing expectation which is disappointed.

Taking the book as we find it, however, we may ask whether the definition that "functional nervous disorders are the expression of abnormally controlled emotional reactions, determined and adjusted by environment and not by any gross or demonstrable pathological lesion" is really satisfactory. Patients do not as a rule die of hysteria or of mnemoneurosis, but if they do, does Dr. Core know of any adequate pathological investigation by the most modern neuropathological technique? It is wiser, we believe, to define psychological disease in psychological terms alone, allowing structural questions to await more light. Among the functional nervous disorders so defined, two main classes may, according to the author, be distinguished: the regressive group, in which the sympathetic nervous system is functionally normal, and the progressive group, wherein some abnormality of that system is discoverable; the former includes "the hysterias" and the latter the "dysthymias" and the "mnemoneuroses," by which expressions we are to understand, apparently, neuroses characterised psychically either by maladaptation of the individual to the instinct of the herd, or by his maladaptation as a member of the herd to the non-gregarious instincts, respectively. The peculiar terminology employed by Dr. Core renders it somewhat difficult to follow his argument, even for those who are familiar with the clinical types from which his material is derived, and this difficulty is not lessened by his involved style. Summaries, however, inserted at appropriate intervals afford the reader relief.

Dr. Core gives a classification of hysteria into three types—primary, secondary, and tertiary; the necessity for this threefold division is not clear, nor is the language in which it is expressed; thus, tertiary hysteria is characterised by "non-diffusibility of centrifugal emotional tones accompanying the re-activation of pre-formed associational groups, with proportionate inevitability of pre-determined somatic response, the inevitability differing from that in the primary hysterias just as the intensity of the reinvoked emotional tone differs from that of the emotional tone at inception." A simpler expression of his clinical varieties might surely have been found. The treatment of functional nervous disorders follows less unusual lines and can be studied with profit by the reader.

JOURNALS.

TROPICAL DISEASES BULLETIN. Vol. XIX., No. 6, July, 1922.—Sanitation Supplements of the *Tropical Diseases Bulletin* Supplement No. 2.—The current number of the *Tropical Diseases Bulletin* contains a critical review of the outstanding problems in pellagra by A. D. Bigland. The views of the "food deficiency" school are regarded as more convincing than those of the "toxin" school.—In the medical zoology section, Lieut.-Colonel A. W. Alcock has reviewed 80 papers, the subject-matter varying from intestinal protozoa to faunal surveys.—The section on sleeping sickness by Dr. A. G. Bagshawe contains many excerpts from the German literature on Bayer 205, the new trypanicidal drug.

The second of the useful digests of sanitary information, issued under the editorship of Lieut.-Colonel W. W. Clemesha as sanitation supplements to the *Bulletin*, contains under the section of Disease Prevention reviews of 37 papers of greater or less importance. Especially worthy of notice is Balfour's contribution on medical and sanitary problems in Mauritius.—An account of plague in South Africa, its perpetuation and spread by wild rodents, is contributed by J. A. Mitchell, wherein he states[1] that in February 1921, in an outbreak on a farm in the Orange Free State, the gerbille and the multimammate mouse, common denizens of the veld, were found naturally infected with *B. pestis*.—Under the heading of "Conservancy" recent work by W. G. Macpherson on the disposal of latrine contents is noticed. Admirable photographs by Messrs. Activated Sludge, Ltd., show the mechanism in both large and small sludge installations and afford medical officers in hot countries an accurate idea of what a modern installation should look like.—A paper by J. Borland McVail on the survival of hookworm ova and larvæ in septic tank latrines in India is of interest, almost identical conditions having been observed by Leiper and his commission in British Guiana.—Water is discussed in a review of seven recent communications, and other sections include small-pox vaccination, disinfection, and vital statistics.

QUARTERLY JOURNAL OF MEDICINE.—The July number contains articles by the following authors:—B. W. Williams and S. C. Dyke: Observations on Creatinuria and Glycosuria in Myasthenia Gravis. Not many observations have been published upon the creatin metabolism in cases of myasthenia gravis. The authors of this paper determined the creatin excretion in four cases, in all of which creatinuria was present. A definite inability to deal with even small amounts of creatin administered by the mouth was found in half the cases. Portions of muscle excised in two sufferers from the disease showed a creatin content slightly below normal. Blood-sugar determinations revealed the fact that although the tolerance to small amounts of sugar was normal, it was diminished for larger quantities. This is considered due to a defect in muscle storage, for a lævulose test showed no lowering of liver function.—Archibald Edmund Clark-Kennedy: On the Therapeutic Value of Quinidine in the Treatment of Auricular Fibrillation. A series of 20 cases admitted to the wards of a general hospital were treated with quinidine. They were not specially selected, but those suffering from failing compensation were not so treated. Quinidine was given usually in doses of gr. 5, six-hourly for 72 hours, and then increased gr. 1 daily until the desired result was obtained or it was considered advisable to discontinue the treatment. In 85 per cent. of these 20 unselected cases of auricular fibrillation normal cardiac rhythm was restored. In the majority of instances a course of digitalis was given before the administration of quinidine. In one case it was necessary to persist with quinidine treatment for 15 days before normal rhythm was established. There appears to be a tendency to relapse if the drug is entirely discontinued. Certain toxic features, such

[1] See THE LANCET, 1921, ii., 1177, 1234.

as headache, nausea, &c., usually accompanied the administration of the drug, and in three cases definite emboli occurred.—John Hay: Quinidine Sulphate in Cardiac Disease. Dr. Hay records his experience in treating 15 cases of heart disease with quinidine sulphate. These included 12 cases of established fibrillation of the auricles, in six of which there was a total failure to obtain a normal rhythm. One recent case of fibrillation was treated and normal rhythm established. One case of paroxysmal tachycardia died shortly after normal rhythm was established. Some brief notes on five additional cases of fibrillation are also included, in all of which quinidine administration was followed by the restitution of normal rhythm, but in one case a cerebral embolus was formed.—Leonard Mackey and Archibald E. Garrod: On Congenital Porphyrinuria, associated with Hydroa Æstivale and Pink Teeth. The paper opens with an account of the previously recorded cases of this peculiar metabolic abnormality. Experimentally, it appears conclusively demonstrated that the injection of hæmatoporphyrin renders the subject very sensitive to light, and the presence of the porphyrin in the tissues is the cause of the hydroa induced by exposure. The authors record in detail a fresh example of congenital porphyrinism. The striking features of their case are the pink coloration of the teeth, the annual outbreaks of hydroa æstivale on the exposed cutaneous surfaces, and the presence of considerable quantities of porphyrin in the urine and fæces. Evidence is also adduced that the bones were deeply pigmented. The article is illustrated by two excellent plates, one in colours.—H. Gardiner Hill: An Investigation of the Basal Metabolism in Unstable Conditions of Certain Endocrine Glands. The author has carried out basal metabolism experiments, using the Douglas bag method. It was found that the basal metabolic rate affords valuable information as to the activities of the thyroid gland in thyroid lesions, and also gives indications as to the appropriate treatment. Observations were also made on cases of pituitary disorders; in acromegaly a high basal metabolic rate was usually obtained which may fall below normal in the late stages; in hypopituitarism the figures were below normal. Twenty cases of nocturnal enuresis in children were investigated, and in general a low basal metabolic rate was present, which is in accordance with the theoretical deduction that the condition is a manifestation of vagotonia associated with thyroid deficiency.

BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING AT GLASGOW.

(*Continued from p. 342.*)

SECTION OF SURGERY.

WEDNESDAY, JULY 26TH.

AT the first session the chair was taken by Prof. H. ALEXIS THOMSON, the President of the Section.

Prof. J. RUTHERFORD MORISON (Newcastle-on-Tyne) opened a discussion on the

Diagnosis and Treatment of Cholelithiasis.

He said that the treatment of gall-stones was essentially surgical, and he laid down the following rules governing such operative procedure: 1. Incision. The transverse incision associated with his name was the best, for it gave good exposure, and only the eleventh dorsal nerve was divided. 2. When a stone is in the gall-bladder, which is normal in appearance and capacity, the stone should be removed, the incision in the gall-bladder closed, and the peritoneal cavity drained. 3. If, however, the gall-bladder is shrunken, it should be drained. 4. When a stone is impacted in the cystic duct, a cholecystectomy is the operation of choice. 5. For a stone in the common bile duct, he advised an incision in the duct, removal of the stone, and drainage of the peritoneal cavity without attempting to suture the duct. 6. If a stone is lodged in the ampulla of Vater, then a transduodenal choledochotomy is indicated. 7. The gall-bladder should never be sutured to the anterior abdominal wall. 8. A recurrence of stones after operation demands a cholecystectomy. Prof. Morison further advised that after the first attack the stools should be carefully examined; if stones were found, then it was safe to await further developments; if no stones were found, then operation should be advised forthwith. It sometimes happened in jaundiced patients, in whom a diagnosis of gall-stones had been confidently made, that apparently no stones were present; in such circumstances he made the condition of the gall-bladder his guide to procedure. Adhesions around it or an obviously pathological condition of its walls pointed to stones and led him to a more determined search for the stone. In another condition the state of the gall-bladder was of diagnostic significance, when there was a stone in the ampulla of Vater giving rise to an inflammatory reaction in the head of the pancreas, with such induration as to suggest a carcinoma. He suggested that many such cases of stone were altogether missed and regarded as inoperable carcinomata. With regard to the operative mortality, he pointed out that the high mortality recorded in 1903 was due to the involvement of the ducts and liver in the infective process dependent upon delay in operation.

He called attention to the results of a stone impacted in the cystic duct giving rise to pain of long duration and a distended gall-bladder. There were three different results. 1. Hydrops, rather a chronic condition, in which the gall-bladder was full of mucus, in his opinion was due to the impaction occurring when the gall-bladder was quite empty. In this case there was a well-defined tumour in the typical gall-bladder position. 2. Empyema occurring with infected bile in the gall-bladder. This gave rise to a more indefinite tumour owing to the adhesions around it of omentum, &c. 3. Acute gangrenous cholecystitis with a heavily infected bile. He referred to D. P. D. Wilkie's work on occluded loops of small intestine, in which the result depended entirely upon the treatment of the loop before occlusion, and gave three parallel pictures of hydrops, empyema, and gangrene. With regard to the third variety, in which there was gangrene of the gall-bladder, he strongly discountenanced attempted cholecystectomy. He always split the gall-bladder from fundus to cystic duct, curetted away the mucous membrane, sutured the gall-bladder around a drainage-tube, and he had found that healing was very satisfactory. With regard to prognosis, operative treatment was most satisfactory for stones in the gall-bladder, but less so when these were in the ducts; and in jaundiced cases the complications were much more common and more severe. His latest conclusions on this subject were summarised as follows:—

Ætiology.—As to causation, he considered that there was much evidence against the infective theory, and this must still remain doubtful. As to predisposing factors, these included pregnancies, fatness, a sedentary life, and a small fluid intake—e.g., in total abstainers and women.

Symptoms.—Stones might lie latent, and in many cases are discovered only post mortem, but of those that did cause symptoms, there were three clinical groups: (*a*) the multiple small stones, which gave rise to recurrent attacks of urgent though temporary character; (*b*) the few medium size stones with sudden impaction; (*c*) the single giant stone, with no symptoms till impaction or infection.

Diagnosis.—There was only one subjective symptom, pain. This was severe, sudden in onset, often compared to a stab in the side, lasting a few minutes or hours. It was felt in the epigastrium and gave rise to "catching of the breath," it might keep the patients awake, or awake them from sleep. There might be vomiting. There was usually a tender

area under the right costal margin, especially on forced inspiration.

Treatment.—Prof. Morison said that much could be learnt of the treatment of gall-stones by comparing this condition with that of stone in the urinary bladder, for the two conditions showed many points of resemblance.

Operative treatment had already been discussed. Cholecystectomy, he considered, should be reserved for the very few cases in which the gall-bladder was irretrievably damaged. His argument against it was that after removal of the gall-bladder the ducts dilated considerably and in so doing largely destroyed their power of resistance to infection.

Mr. FARQUHAR MACRAE (Glasgow) laid down two factors essential to stone formation—viz., bacterial infection and bile stasis. He said clinically it seemed possible that pure cholesterin stones in the gall-bladder might form without any infection, though experimental evidence was against it. These, however, never gave rise to an empyema of the gall-bladder. Most cases were mixed stones and for these the two factors were always present. Infection caused a catarrh of the mucous membrane which led to excess mucus formation, which in turn caused precipitation of bilirubin-calcium from the bile. The infecting agent reached the gall-bladder either by the blood stream or ascended from the intestine, mainly by the latter route, in his opinion, for the following reasons: 1. Animals fed on large doses of bacteria soon had these organisms in the biliary system. 2. Stone formation needed an attenuated organism. 3. The conspicuous rarity of abscesses in the gall-bladder wall. He explained that the bile stasis was caused by an increased acidity of the bile, and kinking of the ducts due to such conditions as a mobile ascending colon. Predisposing causes were repeated pregnancies acting by ptosis, and an increased cholesterol content in the blood. Mr. Macrae remarked that the symptoms presented an obvious picture, in that these patients had indigestion over long periods without any remission characteristic of ulcer of the stomach or duodenum. The pain varied in its time of onset after food, was not affected by variations in the nature of the food, and was accompanied by marked flatulence. He agreed with Prof. Morison that treatment was essentially surgical. No medical remedies existed, and the only difficulty was the selection of the most suitable time for surgical intervention. It seemed to him that in those patients who had had no definite attack of colic, who had the so-called gall-stone dyspepsia and were content to keep their indigestion pain, operation need not necessarily be advised. Cholecystectomy should be reserved for cases of empyema or gangrene or well-marked chronic damage to the bladder wall. If removal of the gall-bladder entirely prevented recurrence of stones, it would be the routine procedure; but it was well known that stones did recur in the ducts, and, moreover, both acute and chronic pancreatitis occurred, which was difficult to treat when no gall-bladder was available for anastomosis. The vexed question of removal versus drainage should be left to the general practitioners to decide, for they could say which of their patients did best in the long run. When he did remove the gall-bladder he always started from the fundus.

Mr. D. P. D. WILKIE (Edinburgh) said that the indications for operation were the attacks of indigestion, for most of the so-called classical signs were those of complications. Two methods of diagnosis were open for use—viz., X rays and the duodenal tube, which had so great a vogue in the United States but had not been taken up in England to any great extent. He believed that the infection was much more frequently blood-borne than was generally thought, for the organisms and the only infective processes were found in the submucous coat of the gall-bladder. He compared the gall-bladder not to the vesical bladder but to the appendix, and pointed out that it was much more logical to remove an infected focus than to leave it. It was agreed that the gall-bladder had a function but that no ill-results followed its removal, and therefore he always did a cholecystectomy unless the procedure would entail an additional unwarranted strain on the patient's resources, or there was an indurated head of pancreas.

Mr. ARCHIBALD YOUNG (Glasgow) could not agree with Prof. Morison's doubts upon the infective factor in stone formation. He considered the evidence conclusive. More attention and teaching was needed as to the differential diagnosis of stones. With regard to treatment, he advised a paramedian incision and a removal of the gall-bladder, always starting at the fundus. The convalescence was more rapid and the mortality less in cholecystectomy. He gave statistics of the following 91 cases:—

50	cholecystostomy	5 deaths.
25	cholecystectomy	0 ,,
7	partial cholecystectomy	0 ,,
4	cholecystostomy and choledochotomy	2 ,,
5	cholecystectomy and choledochotomy	1 death.

Mr. R. H. PARRY (Glasgow) remarked that cases of gall-stones invariably came too late, usually after several attacks of colic. The right time for operation was after the first. The actual nature of the treatment depended upon the infection; if this was primary in the gall-bladder, it should be removed, but a more general survey of the biliary passage was needed. He said that the less done to the common bile-duct the better.

Mr. R. M. HANDFIELD-JONES (London) drew attention to diagnosis by X rays. Particularly he advised the more general use of the procedure known as pneumo-peritoneum for these pictures, recalling the demonstration last winter at the Royal Society of Medicine by Prof. Carelli of Buenos Ayres. There were certain dangers, which could all be overcome by attention to details of technique. A mixture of oxygen and CO_2 was used and injected through a long fine needle at a pressure of 10 mm. of mercury, regulated by a mercury blow-off in the circuit. That the needle was in the peritoneal cavity and had not penetrated a coil of intestine was shown by the fall of the manometer reading immediately on entering the peritoneum. During the taking of the plates the patient must not be allowed to move, any desired alteration in position being done for him, or the tube should be moved. After the completion of the exposures the gas should be withdrawn by a wide-bore needle. If these details were carried out, no ill-effects would follow. With regard to treatment, he considered cholecystectomy should be reserved for cases of irreparable damage to the gall-bladder. When this was performed he always started at the fundus, for in those cases in which a cholecystectomy was really justifiable it was quite impossible to differentiate the various structures in the pedicle and ligate them separately.

Mr. T. S. NOVIS (Bombay) quoted a case in support of the infective theory. A patient came to consult him concerning a gall-bladder fistula of three months' standing. Discharge and stools both contained typhoid organisms. A stone was found impacted in the cystic duct, and its removal rapidly caused the typhoid infection to clear up.

Mr. H. S. SOUTTAR (London) recalled a similar case in the London Hospital, in which the gall-bladder was drained. No typhoid infection was suspected until two nurses became infected. He believed that 4 per cent. of all cases had a typhoid infection.

Mr. H. N. FLETCHER (Brighton) considered that three factors are needed for the formation of stones: (1) increased cholesterol content of blood; (2) stasis; (3) infection. Of his 23 cases, three had duodenal stasis and 14 had migraine. He wondered if the last was more than a coincidence.

Mr. R. D. MOTHERSOLE (Bolton), Mr. CHILDE (Portsmouth), and Dr. ARTHUR JONES (South Wales) also spoke.

Prof. P. BULL (Christiania) read a paper on

Extrapleural Thoracoplasty in the Treatment of Pulmonary Tuberculosis,

giving an account of 75 cases treated by operation. He first discussed the indications for thoracoplasty, pointing out that this operation was in the same category as artificial pneumothorax; the latter, being a much less formidable procedure, should always be tried first, and thoracoplasty should not be considered until inflation had been tried and failed. Moreover, the other, or "sound," lung must have been free of signs and symptoms for at least three months, or if diseased must have remained stationary for many months, and these conditions must be checked by X rays. Before the question of operation was raised at all, naturally, ordinary sanatorium treatment should have been tried. In his opinion, a hæmoptysis definitely indicated the operation. Tuberculosis of the larynx and of one kidney were not contra-indications; in one of his patients he had removed one kidney as well as performing the thoraco-plasty.

His operative technique was as follows: The patient was placed on the healthy side, and an incision was made midway between the spines and the vertebral border of the scapula to give an exposure of the upper 10 ribs. He removed 2–3 cm. of the first rib, 10 cm. of the second rib, 12 cm. of the third, and 15–20 cm. of all from the fourth to the tenth ribs inclusive. It was essential to resect the ribs as far back as possible, right back to the tips of the transverse processes, otherwise the soft parts did not fall in properly. The resection of the first rib was often a very difficult procedure, and for this he had modified Doyen's raspatory. He always drained the incision and supported it by strapping. He had come to the conclusion that a two-stage operation gave the best results, the resection of the first, second, and third ribs being left to the second operation. All operative work was done under local anæsthesia. The immediate complications likely to occur were dyspnœa due to mediastinal flapping, and displacement of the heart, troublesome expectoration, and pain. The expectoration rapidly decreased after operation, as did the numbers of tubercle bacilli.

Prof. Bull said that between May, 1914, and May, 1922, he had operated on 75 cases, of whom 37 were men and 38 women. Of these cases the operation was right-sided in 29 and left-sided in 46. There had been eight deaths, three men and five women; seven had occurred in operations on the right side. He found it difficult to talk very definitely of end-results, for in his opinion it was as impossible to write cured against these tuberculous patients as in cancer. There seemed no limit to the time of recurrence. Many slides were shown illustrating the operative methods, and three patients, one female and two males, who had been operated on early in the series were shown.

THURSDAY, JULY 27TH.

At this session the chair was taken by Sir KENNEDY DALZIEL, when Dr. JAMES CARSLAW (Glasgow) opened a discussion on the

Surgery of the Non-traumatic Affections of the Spleen.

He said that the spleen was known not to be essential to life, and removal of this organ had been successfully performed in the sixteenth and seventeenth centuries. It was now clear that there was a compensatory hypertrophy of the lymph glands and bone marrow. There was very little really known of the functions of the spleen, but it was generally agreed that in the adult it did not create red cells as it had done in embryo, but it did destroy them and pass on their contents to the liver to be dealt with. There was a possibility that the spleen had an internal excretion regulating the formation of red cells in other parts of the body; lastly, it had a phagocytic function in such diseases as malaria, kala-azār, and syphilis. Splenomegaly occurred in the following conditions: (1) various infections, e.g., septicæmia; (2) certain blood conditions, e.g., pernicious anæmia and lymphadenoma; (3) the leukæmias; (4) erythræmia, in which the enlargement was compensatory; (5) toxic diseases centred in the spleen, e.g., splenic anæmia and acholuric jaundice. In his opinion only group 5 were suitable for splenectomy. He gave details of some of his cases: 2 cases of splenic anæmia were both alive, one after 10 years, 2 cases of acholuric jaundice were sisters and gave no symptoms till adult life, both then experiencing gynæcological troubles. Both made a rapid recovery, but one developed tuberculous peritonitis one year later. One case of tuberculous spleen with a doubtful cavity at the apex of one lung was well after two years. One case of pernicious anæmia had an improved blood picture after operation, but it was doubtful if any permanent good had been done. One case of doubtful pathology died of hæmorrhage one year afterwards. In conclusion, he considered that there was a very wide variation in pathological types and that the mere presence of a large spleen was not sufficient indication for removal. He discouraged operation in malaria, syphilis, and the leukæmias; of the value of splenectomy in pernicious anæmia he was not convinced; but he advised it in splenic anæmia and acholuric jaundice. Operation was useless if the liver was affected as well.

Dr. E. H. KETTLE (London) said that he had no desire to belittle the triumphs of empiricism, but he thought that a great deal more knowledge of the spleen was needed before rules could be laid down for splenectomy. With regard to the functions of the spleen, it was essential to realise that the spleen was neither anatomically nor functionally an entity, but a part of the hæmopoietic system. It was not a place where red blood cells were formed, but it acted as a scavenger for the old and worn-out red cells, disintegrating them and liberating hæmoglobin. As a part of the reticulo-endothelial system, it acted as a barrier against infection, phagocytosing organisms, and, moreover, contained a larger quantity of immune substance than the rest of the body. By various observers the function of the spleen was linked up with the digestive system, the ductless glands, and the sympathetic nervous system. The difficulty was to correlate all the research on the subject; but the facts known, though few, were well established—viz., removal is followed by (1) a secondary anæmia for two months, returning then to normal; (2) a marked relative leucocytosis for four months, then becoming normal; (3) a decreased fragility of the red cells for some time, both in vivo and in vitro; (4) an increased resistance to jaundice or hæmoglobinuria. Two points of experimental interest he thought were worth recording, firstly, that animals fed on lipoids showed marked lipoid storing in the spleen; secondly, that no results at all had been obtained by feeding animals on spleen extracts. In passing, Dr. Kettle remarked that it appeared to be a very general idea that a saline extract of an organ necessarily contained the normal active principle of that organ, and he contended that this view could not be substantiated. After removal, the functions of the spleen are taken over by the bone marrow. In discussing the pathology of the spleen he made it clear that the range of pathological varieties was very great, and that as yet practically nothing was definitely known of them. Splenic anæmia was an admirable example, for the position was most anomalous, and Banti himself did not help by dividing it into three stages, the first of which lasted 12 years. Dr. Kettle knew of no other chronic process of that sort which remained stationary for 12 years. He went on to show by means of lantern slides the many variations that occurred in routine microscopic examinations of enlarged spleens. He concluded that it was impossible to stereotype splenectomy until the pathology of these conditions was much better known. He agreed that it seemed to do good in acholuric jaundice, though even in these cases the fragility remained for years. He was inclined to think that splenectomy was also justified

as a palliative or even prophylactic measure in certain conditions as malaria, where the spleen was the storehouse of the parasite and also was very liable to rupture.

Sir KENNEDY DALZIEL said that the operation was not dangerous, patients, even in most unfavourable condition, standing it well. He made a left rectus incision and cut across the rectus if necessary. The pedicle was clamped in two places and removed with the blood still in it.

Mr. A. J. WALTON (London) read a paper on the

Surgery of the Pituitary Gland,

in which he brought forward some of the more salient anatomical features, and criticised the methods of operative approach from the anatomical standpoint. He pointed out that the inferior relations of the sella turcica were the basi-sphenoid and the sphenoidal sinus. The attachment of the nasal septum to the floor of the sphenoidal sinus varied considerably, as did also that of the sinus to the sella turcica. There were some cases in which the line of attachment of the septum corresponded to the cavernous sinus. From these reasons, as well as the great risk of infection, the nasal method of approach was not recommended. The lateral relations included the cavernous sinus and the second, third, fourth, fifth, and sixth cranial nerves, and the arterial circle of Willis. It was not generally recognised that enlargements of the pituitary gland might cause pressure signs on the fifth nerve. He described in some detail the relation of the gland to the optic tracts, chiasma, and nerves, and showed that large tumours may cause complete blindness instead of the usual bitemporal hemianopia, by growing up in front of the chiasma, as well as behind it.

Mr. Walton classified the types of pituitary disorders as follows:—

(*a*) Increase of anterior lobe secretion causes (1) before puberty: gigantism; (2) after puberty: acromegaly.

(*b*) Decrease of anterior lobe secretion causes (1) before puberty: lack of bony development; (2) after puberty: a variety of fragilitas ossium.

(*c*) Decrease of posterior lobe secretion gives (1) in young: Fröhlich's syndrome; (2) in adults: adiposis dolorosa.

The symptoms were those of pressure such as blindness, complete or partial, ocular palsies, trigeminal neuralgia, and generalised intracranial pressure. In his opinion all the enlargements were cysts or adenomata, and therefore treatment held out hopes of complete success; but acromegalics who had no glycosuria or eye signs should not be operated upon. His method was the frontal approach which by means of an osteoplastic flap and careful retraction of the frontal lobe gave an admirable exposure. The mortality was 30 per cent., a high figure due to the fact that so many patients had already signs of increased intracranial tension before operation.

Mr. G. H. EDINGTON (Glasgow) read a short paper on the

Plating of Fractures.

He gave a brief historical survey of the subject, and then pointed out that unless complete restoration of the anatomical alignment was secured, secondary changes occurred and re-education was needed in the neighbouring joints and muscles. In his opinion in many cases only operative measures secured this perfect alignment. He found that the tibia, femur, humerus, and forearm bones in that order of frequency most often needed plating. He always used Lane's plates and screws, but removed them during the third or fourth week.

Mr. ARCHIBALD YOUNG (Glasgow) presented a five years' survey of direct fixation of fractures, briefly explained his tables, and showed many X ray photographs illustrative of his methods. In a series of 693 fracture cases treated by him in the Western Infirmary, Glasgow, during the five years from 1917 to 1922, open operation was carried out in 272 cases, with direct fixation of fragments in 103. Of these 21 were treated by wiring, 29 by pinning or nailing, 48 by plating, 2 by screws, 2 by pinning and plating, and 1 by ring-plates. Silver wire had been almost given up as a fixation agent, brass wire, or nickel wire was preferred. A newer wire, made of Monel metal, composed of copper, 67 per cent., nickel, 33 per cent., was recommended as satisfactory.

Mr. DONALD DUFF (Glasgow) discussed the

Treatment of Un-united Fractures with a Bridge Graft.

He had had 60 cases of this type. He stressed the importance of allowing all sepsis to subside before operating, and he emphasised the importance of eradicating all scar tissue in the bone ends as well as in the soft parts. He used various types of graft, of which the inlay had been most successful.

FRIDAY, JULY 28TH.

At this session Mr. JAMES BERRY took the chair.

Sir W. ARBUTHNOT LANE opened a discussion on the

Non-Malignant Affections of the Colon.

Formerly diseases of the colon had been divided into several separate entities, but he was convinced that in reality they were all direct or indirect results of chronic intestinal stasis. This large group of cases presented two groups, depending upon whether or not they produced a neighbouring peritoneal reaction.

A. *Group Characterised by the Formation of Bands.*—In this group the peritoneal reaction took the form of bands, which began as fine condensations on the surface of the peritoneum of the mesocolon, enlarged their extent, reached on to the bowel wall, and finally became separated except at each end. A band was thus formed that attached the gut to the parietes. The best known example of this band was that which developed in connexion with the iliac colon. This band then began to contract, and so anchored the colon in the left iliac fossa, diminished the lumen of the bowel by angulation and rotation upon its long axis. In addition this membrane might catch up the left ovary or Fallopian tube, and in this way be the cause of extra-uterine fœtation, left tubal sterility, and cystic ovarian changes. To this band and the kink in the colon that it produced he had given the name of the "first and last kink"; first because it was the first of all bands to develop, and last due to its position in the intestinal tract. He continued: "This development of a band controlling the lumen of the lower portion of the bowel is perhaps the most important acquired change in the whole body, since it is the primary cause of a vast amount of subsequent trouble in the gastro-intestinal tract and elsewhere. Its immediate effect in producing an obstruction at this point is to render the partially occluded colon a very common seat of cancer, while in fat subjects the bowel proximal to it is a very usual site of diverticulitis. The indirect consequence of the obstruction of matter through the first and last kink is the accumulation of material in the whole length of the colon." Sir W. Arbuthnot Lane went on to describe the development as a result of the increased load in the obstructed bowel, of precisely the same type of acquired membrane on the outer layer of peritoneum which extends from the convexity of the large bowel to the abdominal wall, notably a band from the liver, gall-bladder, duodenum, and pylorus, which descends to hold up and later obstruct the transverse colon, this band being known in America as Lane's kink. Sir W. Arbuthnot Lane then passed to a short consideration of the causation of these bands, in the course of which he pointed out that they could not be held to be congenital, for Chapple had examined 60 fœtuses at or near full term and in none could he find any such bands; further, there was evidence to regard them as inflammatory, and he believed them to be evolutionary. They are called into being for one especial purpose—to prevent prolapse, and it was not until they began to contract that they gave rise to symptoms. Before leaving this group, he referred to the "controlling appendix," which became attached to the under surface of the mesentery of the terminal ileum.

When ptosis of the cæcum occurs into the pelvis the ileum is kinked over the appendix and stasis occurred, giving rise to a static colon in which the onset of carcinoma was markedly increased.

B. *Group Characterised by Absence of Bands.*—In this group no bands or membranes were formed, and the pelvic colon prolapse into the pelvis without hindrance. It became elongated with much angulation and kinking, and the obstruction in these cases was due to puddling in the pelvis. Following on this condition the proximal colon became elongated and prolapsed. Infection of the mucous membrane then occurred, which in its turn gave rise to muscular spasm causing a smaller lumen to the bowel. In this type there was no single point of fæcal impaction, and therefore carcinoma but rarely supervened. The speaker then passed to the operative treatment of these conditions and their complications. The bands should be very carefully dissected away, and the whole tract searched for more than one band, and the peritoneal cavity should always be drained, because of the numerous divided lymphatics in the cut edges of the bands. Diverticulitis in fat subjects was a common complication and required an ileo-sigmoidostomy. Tuberculous ulceration called for complete or partial colectomy. Those without reaction suffered largely from auto-intoxication, and many of these patients had severe chronic arthritis. The treatment giving best results was either a colectomy or an ileo-sigmoidostomy. He wished once again to lay it down with all possible emphasis that in these cases no operative procedure was justifiable until prolonged medical treatment had failed.

Mr. GEORGE WAUGH (London) said that the colon was liable to many variations both in position and fixation. In the course of 100 post-mortem examinations at Great Ormond-street Hospital there were found to be 38 complete primitive mesocolons, 14 parieto-colic bands, 5 gall-bladders with a ventral mesentery, one cæcum was found under the liver, and in one case the foramen of Winslow was absent. Since his last report on this subject he had operated on 188 adults and 22 children; and of these 177 had ascending mesocolons, and in 33 the ascending colon was tied down by a band just about its mid-point. He considered this to be the first place where the mesocolon of the ascending colon disappeared, the process normally spreading up and down, and in these 33 cases the normal disappearance had just begun then stopped. This band was opaque and non-vascular, and though sometimes the two were confused, this was *not* a Jackson's membrane. In fact, in his experience he had never seen the so-called Jackson's membrane. Occasionally the cæcum was found in the left iliac fossa owing to non-rotation of the mesentery. He pointed out that in those cases of high-lying cæca the terminal ileum had a steep vertical ascent and was frequently retro-peritoneal. He then passed to the clinical picture of these cases. There was no environmental ætiological factor, for they occurred in all grades of society. The common ages were between 18 and 25. The initial symptoms were nearly always referable to the upper abdomen, and often took the form of hunger pains, occurring most frequently at 4 P.M. and in the early morning. The symptoms were directly due to the downward drag of the prolapsed gut. During operating he had been unable to find the "first and last kink" of Lane. In his hands the mortality was under 1 per cent. He claimed that of his last 210 cases the results were: failures, 20; improved, 92; cured, 98.

Sir HENRY M. W. GRAY (Aberdeen) said the discussion seemed to have turned on pericolic adhesions entirely, and he would confine himself exclusively to those found in the right side of the abdomen. Functionally the ascending colon was the most important part of the large gut, for it was the pacemaker. He could not agree with Lane about the formation of these bands being due to constipation and strain. Nor could there be any ground for the evolutionary theory, for these bands were never of any value for supporting the gut. Some or other of these various bands were to be found in most fœtuses—e.g., Bryant quoted 98 per cent. male and 87 per cent. female fœtuses with bands. All variations of position and attachment were due to vagaries in development. Nor could he agree with Mr. Waugh's views as to Jackson's membrane. He had often seen it and then frequently in conjunction with Lane's kink. In undescended cæca, the terminal ileum came to occupy the real position of the ascending colon, and was often retro-peritoneal. If the cæcum then tended to prolapse, the ileum is kinked and rotated—Lane's kink. Again, the great omentum was but slightly understood, and its extent was often far in excess of the text-book description. It stretches much further to the right, and might be lying over the ascending colon as a membrane of varying density and structure, thus explaining the origin of Jackson's membrane. He had seen the great omentum continuous with a membrane over the gall-bladder, pylorus, and small omentum, and going to the liver, thus obliterating the foramen of Winslow. He drew attention to the fact that Anderson and himself had in 1912 and 1913 written papers on the very subject and drawing the same conclusions as those of Waugh in 1920.

He summarised his views on treatment as follows: 1. Many abnormalities might be present without any deleterious effects. 2. A thorough exploration of the whole abdomen was essential in these cases. 3. In his opinion the word "hypochondriacal" exactly fitted some of the cases and these could be cured without operation. 4. Colectomy he considered very rarely justifiable, but the fixation of the cæcum and ascending colon appeared to him so uniformly successful that he now did it as a prophylactic measure in cases in which he found a mobile ascending colon in the course of other abdominal operations.

Mr. H. J. PATERSON (London) asked three questions—viz., were there any proofs that these conditions led to any symptoms apart from toxæmia; what were the indications for surgical intervention; and what was the most favourable surgical procedure. He answered them in this way—many of the symptoms are those of gastric disorders and these should be carefully eliminated; he considered that charcoal given by mouth should be completely voided in 100 hours in normal people and that anything longer than that connoted stasis; and lastly, he did not do a colectomy, but implanted the ileum into the pelvic colon and permanently drained the colon by an appendicostomy.

Mr. A. J. WALTON (London) emphasised the marked increase in frequency of these conditions. He agreed with Sir Henry Gray that they were all of developmental origin, and thought that 80 per cent. of those that showed symptoms were women. Symptoms did not appear until there was some ptosis. With regard to treatment he wished to draw attention to Lane's oft-repeated teaching—viz., that the treatment was essentially medical and operation was a last resource. He never fixed viscera, unless symptoms directly pointed to one viscus, and even then he warned the patients that they would not be absolutely cured.

Mr. WILKIE read a paper on

Chronic Duodenal Ileus,

in which he demonstrated by means of lantern slides that this was a definite clinical entity. He showed that the distension stopped short at the point where the superior mesenteric vessels crossed the third part of the duodenum and that the condition was easily demonstrable by radiography with the barium meal. The clinical history mimicked the early stage of gall-stones most closely, and in fact he considered that patients giving a history of the so-called gall-stone dyspepsia should be examined in order to exclude duodenal ileus. In some of his cases urgent symptoms had come on quite suddenly and in these the distension was most marked. The treatment was operative, and the procedure consisted of making an anastomosis between the duodenum and the proximal jejunum, for which purpose he

had modified Lane's gastro-enterostomy clamps. He had now operated on 21 cases, and the most surprising thing about them was the extraordinary smoothness of the convalescence.

Mr. J. R. DINGLEY (Wednesbury), Mr. J. CLAY (Newcastle), and Sir KENNEDY DALZIEL (Glasgow) also discussed the paper.

Mr. H. S. SOUTTAR (London) spoke on the

Operative Treatment of Difficult Hernias.

He considered that the most essential feature of any operation, in which a foreign body was introduced, was to find something which would be suitable as a framework for fibrous tissue growth and which could be incorporated in the tissues. He considered that silk best fulfilled these conditions, and he proceeded to describe its sterilisation. It was impregnated with mercury biniodide by immersing it in an alcoholic solution and sterilised by boiling in that solution. It was then stored in sterilised paraffin as this was not a solvent of biniodide of mercury. The gap was then darned with this sterilised silk.

Surgical Operations and Demonstrations.

There was an innovation this year in that all the operations arranged for the benefit of the members of the B.M.A. took place between 8.30 and 10 A.M. It was typical of the keenness and zeal of the large body of the profession present in Glasgow that the theatres were well filled with visitors. The operations covered a wide range and the surgeons of the three main hospitals as well as those of special hospitals had arranged interesting lists. Sir William Macewen showed hernia operations, osteotomies, and mastoids. In addition he demonstrated on results of extensive operations on the lung, of cerebral abscess, and of removal of the tongue for carcinoma. The demonstrations were admirably arranged, Sir William Macewen gave one on July 26th on hernia and one on July 27th on tumours, especially arranged to show his methods of teaching surgery and surgical pathology. On July 26th the demonstration at the Royal Infirmary was well staged, two wards were emptied of their usual patients and filled with special ones, regularly arranged in groups, with specimens and plates. Each surgeon explained his own cases. On July 27th Dr. Leonard Findlay showed at the Royal Hospital for Sick Children children treated by alcohol injections for rectal prolapse, and exhibited his method of obtaining blood for Wassermann tests from children by venesection of the veins of the scalp. Mr. A. MacLennan gave a cinematograph demonstration on scoliosis, and Mr. Alexander Mitchell showed skiagrams of bone regeneration. On July 28th a very large number of cases were shown at the different infirmaries; amongst other operations, Mr. Waugh performed one on a case of mobile ascending colon demonstrating his methods of operative technique.

SECTION OF DISEASES OF CHILDREN AND SECTION OF PHYSIOLOGY.

JOINT DISCUSSION ON THE ÆTIOLOGY OF RICKETS.

WEDNESDAY, JULY 26TH.

AT this meeting, Sir HERBERT WATERHOUSE in the chair, Dr. LEONARD FINDLAY opened the discussion, and mentioned the interesting coincidence that this subject was discussed at the last meeting of the B.M.A. in Glasgow 34 years ago. Rickets had always interested the Glasgow School as it was so prevalent in Glasgow. Although he respected all the work which was being done on animals it was obvious that the final battle must be fought out in the clinical field. There were several broad facts with which the hypothesis of the origin of rickets must be reconciled before it would be justifiable to adopt it as the correct explanation of the condition: (1) Rickets had a definite geographical distribution, though this might be only connected with industrial conditions. It was never found under natural conditions. (2) There was a marked seasonal variation. (3) It was a disease of the poor classes in Europe, while in India it was a disease of the wealthy classes.

Dr. FINDLAY referred first to the difficulties of diagnosis and stated that he was unable to make a diagnosis in mild cases in the absence of definite X ray changes in the bones. He then discussed the different hypotheses and stated that the dietetic hypothesis was the most popular one. He emphasised the difficulty of controlling the diets of children. Hess and Unger showed that cod-liver oil possessed a prophylactic power in preventing the onset of rickets, and he was able to reduce the incidence of rickets among negro children to a considerable extent. Dr. Findlay himself had been able to confirm this statement. Hess also found that rickets did not develop when fat, with its fat-soluble A, was replaced by cotton-seed oil which was officially classed by the Vitamin Committee of the Medical Research Council as an oil which had no fat-soluble A. Prof. E. Mellanby apparently did not accept this report of the Committee. Further, von Pirquet in Vienna had stated that the fat of the milk could be replaced by the addition of carbohydrates. This also agreed with Dr. Findlay's own experience in feeding children who apparently had a difficulty in digesting fat. The observations of H. S. Hutchison[1] at Nasik, India, were also against the diet hypothesis. The latter found that rickets only occurred among the well-fed children of the rich Brahmins who were kept in dark quarters, while the poorly-fed Hindoo child who lived an open-air life never developed rickets. Dr. Findlay also referred to the incidence of keratomalacia among children who were fed on diets deficient in fat, although rickets did not develop. He could not accept the explanation that this might be due to the deficiency of fat being associated with different combinations of other constituents in a badly-balanced diet. Confinement seemed to play a great part, and the institution of massage helped to establish a rapid cure without any other changes in the conditions being made. He also thought that sunlight might have a good action by producing movements of the limbs even though it did not have a specific effect. But he urged the medical profession to rid their minds of the obsession that rickets must necessarily be a deficiency disease, due to the absence of some factor. He preferred to believe that there must be some specific virus which was responsible for the change.

Prof. EDWARD MELLANBY referred briefly to the controversy which raged on this subject and to the different hypothesis which had been mentioned, and then restated the views which he had formed as a result of his work. Rickets was a disease accompanying growth, and was due primarily to defective feeding. A rickets-producing diet was one of unbalanced nature in that it contained too little of those foodstuffs responsible for the proper calcification of bone and too much of those substances responsible for the growth of tissue, these latter substances being either neutral or antagonistic to the deposition of calcium phosphate in the growing bony matrix. Assuming that the diet contained a sufficiency of calcium and phosphorus in a form that could be absorbed from the alimentary canal, the most potent influence for procuring the calcification of bone that he had observed up to the present was something of the nature of a vitamin having a distribution and properties somewhat similar to fat-soluble A. On the other hand, foodstuffs responsible for growth and the laying on of tissue which were indifferent or antagonistic to calcification included the cereals. Generally speaking, therefore, rickets was a disease which followed the ingestion of diets relatively poor in the anti-rachitic vitamin and rich in growth-promoting elements, and more particularly in cereals. He then referred to the question of balance in the diet, and said that some people found it difficult to grasp the new conception that the various essential factors of the diet were so interdependent that many dietetic problems must be considered from the point of view of balance, and it was no longer

[1] THE LANCET, 1922, i., 377.

possible to speak of causes or deficiencies of substances in an absolute way. Thus the amount of fat-soluble vitamin which was sufficient on one diet might be quite inadequate when more carbohydrates were eaten, or the calcium of the diet which was sufficient on one diet became inadequate if the fat was increased. Thus the minimum of any substance essential for perfect health was a variable depending upon the other factors in the diet. He said that his views had been much misrepresented, and while he had no wish to minimise the effect of good hygiene, he maintained that the food factor was the important one. One cause for the different experimental results was that whereas he had used dogs, much of the other work had been done on rats. Where these experiments differed he thought that the dog experiment should be preferred, as dogs were more nearly allied to human beings than rats. One of the difficulties was due to the fact that the rats ceased to grow on a deficient diet, whereas dogs did not, and that the growth factor was an important one in the development of rickets. Calcium played an important part in rickets, but the rôle attributed to phosphorus in recent work seemed much exaggerated. He then discussed the rôle of the cereals, and said that although Cheadle was strongly of the opinion that they were very important, yet there had been no experimental proof on animals that this was the case. He had originally thought that the severity of rickets, other things being equal, depended on the amount of carbohydrates eaten, but he had recently found that this was not the whole story. Thus oatmeal, which contained less carbohydrates than white flour, was accompanied by worse rickets than was the case with white flour. The starchy food also made an animal grow more. He thought there was some other factor about oatmeal which must account for its deleterious effects. He could not find any evidence for the hypothesis of Dr. Findlay that some specific virus was a prime cause, and asked him to produce some evidence in its favour. The claims of sunlight and ultra-violet light had been recently advocated by several authors. In the case of puppies with dark hair sunlight had not produced any effect, though this might be due to the thickness of their coats. He briefly referred to the possibility that some chemical substances might be liberated by the action of the sun on the skin. He suggested that the following statements would cover most of the conditions where diet and sunlight interact: (1) That when a child was well fed the presence or absence of sunlight made no difference to its health in so far as rickets was concerned. (2) That in the case of a child fed on a mediocre, border-line diet, exposure of the skin to sunlight would probably prevent rickets. (3) That in the case of badly fed children—that is, when the diet contained much cereal and a deficiency of fat-soluble vitamin and calcium—sunlight would not prevent rickets, but might ameliorate the symptoms to some extent. He regarded sunlight and exercise as of secondary importance to diet in the ætiology of rickets.

Dr. ROBERT HUTCHISON spoke from the pure clinical point of view. He thought that the dietetic factor could not be dismissed as Dr. Findlay had suggested, since it was possible to cure almost any case by means of a change of diet. It was remarkable that Cheadle's views as expressed 34 years ago were still accepted by the majority of physicians. Von Pirquet's views on the possibility of substituting carbohydrates for fat were remarkable, for no diet was more apt to produce rickets than one of sweet condensed milk. Although hygiene played a part it could not be the only factor, and a change of diet by itself was sufficient to alter the whole course of the disease. He could see no evidence in favour of Dr. Findlay's hypothesis of a specific virus.

Prof. NOËL PATON criticised Prof. Mellanby's experiments and conclusions. He said that from his experience he could not find any evidence that butter contained any antirachitic factor. But in the report of the Medical Research Council butter was classed as being of equal value with cod-liver oil, whereas the latter was, in his opinion, of great value in the treatment of rickets. He expressed the opinion that the Medical Research Council had erred on this point. One of the complicating factors was the self cure of rickets, which might take place no matter what diet the animal was having. He did not believe that growth played any part in the process, for experimental puppies which were kept in the country were bigger than those grown in the laboratory, but they did not develop rickets although the diet they were eating was a poor one. He agreed with von Pirquet that the energy value of the diet was of great importance in preventing rickets, and he had reared healthy puppies which were fed on separated milk with a great excess of bread. He also laid stress on the value of the salt content of the diet, especially that of calcium, and added that the figures of the various salt contents of foods must be carefully checked. The provocative effect of bread and cereals mentioned by Mellanby had not been observed in Glasgow. The effect of oatmeal in Mellanby's experiments was very difficult to understand, as oatmeal had three times as much calcium as bread. He had not found any evidence of the specific virus of rickets, and he had failed to communicate rickets to puppies either by the injection of the blood of children with rickets or by mixing their fæces with the puppies' food. He expressed the opinion that an effort should be made to combine together in order to devise a definite plan of operation in the hopes of getting an answer to this question.

Prof. V. KORENCHEVSKI stated that rickets could be produced in rats provided that they were not more than three to six weeks old at the onset of the experiment. If the rats were eight weeks old the changes in the proliferating cartilage were not so well marked and the animals suffered from osteomalacia. If the rats were twelve weeks old the changes in the skeleton were insignificant. He thought that the action of A-vitamin on the skeleton was the result of the combined action of several factors, only some of which were known at present. The primary and highly important function of A-vitamin consisted in its property of conducing to the normal deposition of lime salts in the bone and to normal calcium metabolism; a secondary and quite as important function of A-vitamin was its property of conducing to the growth and to the normal nutrition of tissues; the tertiary property of A-vitamin was its power of inducing a normal state of appetite. The deficiency of A-vitamin in the diet of the mother resulted in marked aggravation of the skeletal diseases of the offspring. He concluded by saying that the factors playing a great part in the origin of the disease were (1) the deficiency of A-vitamin, or at any rate an organic factor closely connected with it, (2) the amount of calcium and phosphorus, (3) confinement, and (4) insufficiency of sunlight.

Dr. J. B. D. GALBRAITH gave an account of the experiments which had been made in Glasgow with different amounts of fat in the diet of children. The children were fed on artificial diets with sufficient or insufficient fat, but there had been practically no difference in the incidence of rickets in the two classes. The same was true of breast-fed children in whom the fat of the mother's milk was sufficient or insufficient. This was only true of the conditions present in the winter, for in the summer rickets was rarely observed.

Dr. SIM WALLACE said that as a result of the inspection of teeth in the schools it appeared that caries was not a deficiency disease, but rather a luxury disease, as it was common among the well-fed children who had excess of easily fermentable food which stagnated among the teeth. His main point was that the cement of the teeth was laid down on the teeth before the deficient diet had been started.

Major H. S. HUTCHISON reported the results of his observations on the teeth of the groups of Indian children referred to by Dr. Findlay. The

incidence of caries among all the children was very small and did not differ among the three groups at all, although the well-fed child kept in confinement often developed rickets, while the poorly fed child who ran about in the open air was healthy.

Dr. J. B. ORR gave a communication on the effect of the alteration in the mineral content of the diet. He said that the deficiency of the calcium in the bones depended on the calcium and phosphorus ratio in the diet. Further, excess of potassium in the diet might upset the calcium intake. The diet must contain all the minerals in the proper ratio and in the form in which they could be utilised. He had fed series of young pigs (1) with a diet of cereals deficient in salts; (2) with the same amount of cereals, together with the salts in the same concentration as they were in sows' milk. The latter group grew well and showed no signs of rickets, whereas the former group developed severe rickets. The addition of cod-liver oil to these deficient salt diets only delayed the onset of the rickets, and did not seem to have any curative effect.

Dr. W. E. ELLIOT, M.P., agreed with the view that diet played a part, but did not think that A-vitamin was a necessity. He disagreed also with those who said confinement was necessary, since sheep that ran about on the hill-side developed typical rickets. He agreed with Dr. Orr that the balance of salts was very important, and was doubtful of the value of experiments on rats, since there was no information as to the salt content of rats' milk. In his opinion, this invalidated the conclusions drawn from rat experiments.

THURSDAY, JULY 27TH.

At this session Prof. NOËL PATON presided. Prof. E. P. CATHCART opened a discussion on

Basal Metabolism.

He said that he proposed to confine his remarks to the physiological phenomena connected with the consumption of oxygen. By the examination of the urine the changes which took place in the metabolism of proteins could be determined, but by measuring the intake of oxygen and the output of carbon dioxide more information could be obtained on the intracellular changes than from the examination of the urine. There were, however, difficulties in doing this, and many precautions must be observed in order to obtain correct results. (1) The patient must be examined after a period of fasting of 12 to 15 hours' duration. (2) It was also important to see that the type of food eaten for a few days beforehand was always the same; for, working with J. B. Orr, he had found that extra protein might cause considerable increase in the metabolic rate. (3) The amount of muscular work which the patient had done the day before was also important and should be regulated. For comparative purposes it was really preferable to take account of the amount of oxygen consumed rather than the calorie output per kilo, since the latter was dependent on the respiratory quotient (R.Q.). Under the conditions of the experiment the R.Q. was taken as 0·82. This was usually correct, but if more carbohydrates were burnt than usual the R.Q. would be higher than 0·82, while if more fat was burnt the R.Q. would be less than this figure. Therefore unless the R.Q. was determined for each patient the error thus introduced might be considerable. A further complication was introduced, since the metabolic rate was not constant throughout the day, and was lowest at midnight. There was also a seasonable variation, and the metabolic rate was highest in the winter. But if account was taken of all these factors, the basal metabolic rate remained reasonably constant for each individual. It was possible with the new instruments to take the basal metabolic rate in a consulting room, and in the United States this was already being done. Unless the observations were made under the necessary conditions the results obtained could only bring discredit on the method; a "stunt" such as this was to be avoided if possible.

Dr. J. B. ORR said that all the circumstances influencing the time which was required for the metabolic rate to fall to a constant level after different types of food were not yet known. In the case of the pig four days might be necessary. The effect of the nervous system on the metabolic rate was very great and should always be considered. The basal metabolic rate was the sum total of an enormous number of changes, and the time of day, the nature of the previous diet, and the environment must always be taken into consideration.

Prof J. C. MEAKINS said that he had appreciated Prof. Cathcart's warning about the dangers of drawing conclusions from badly-conducted experiments. He had found that the normal variation of the basal metabolic rate in patients was ± 10 per cent., and with proper precautions the results could be applied to medicine. The question of the R.Q. was an important one, and it was necessary to estimate both the oxygen and carbon dioxide in order to get over the difficulty. In 80 per cent. of his cases it was less than 0·82, and it varied from 0·68 to 0·95. The routine which he used was similar to that recommended by Prof. Cathcart. He had found definite changes in thin and starved persons, as the basal metabolic rate might be very low under these conditions, but under the influence of rest and food the basal metabolic rate gradually returned to normal. The chief changes took place in diseases of the thyroid gland, and he showed graphs of the effect of rest in bed, or removal of a portion of the thyroid on the basal metabolic rate. He preferred to wait until the basal metabolic rate had returned to normal before operating on the patients. He also showed graphs illustrating the effect of thyroid extract in a case of myxœdema and of cod-liver oil and iodine in increasing the basal metabolic rate. He showed that other ductless glands had some influence, thus adrenalin raised the blood-sugar and the basal metabolic rate and also caused an increase in the respiratory quotient.

Dr. G. B. FLEMING said that the basal metabolic rate was very high in children, and gradually decreased as the child grew up. The question as to what proportion of the high metabolic rate in young children was due to the growth of the child was a complicated one, but he believed that only 5 per cent. of it could be ascribed to the actual growth requirements.

Dr. LEONARD HILL said that it was always important to avoid taking the initial readings, as errors might occur. Pressure changes in the lungs also caused big changes in the rate, and hyperpnœa raised the rate very considerably. He had found that sitting up in a chair would increase the rate, and taking off all clothes or sitting in a garden with clothes always sent up the rate. All the children at the Treloar Home at Alton and Hayling Island had very high metabolic rates, as they lived in the open air without clothes. He had found that it varied with the cooling effect of the air, as was shown by the change in the kata-thermometer. He did not think that it was due to the effect of the sunlight, as red-headed children who were sensitive to the sunlight had the same rise in the metabolic rate.

Dr. C. M. WILSON showed graphs illustrating the fall in basal metabolic rate in cases of exophthalmic goitre which was produced by the action of X rays or partial thyroidectomy. He mentioned cases of menorrhagia[1] with a high basal metabolic rate in which after a course of X ray treatment to the thyroid gland there was a fall in the basal metabolic rate and the menorrhagia was cured.

Prof. CATHCART replied to several points which had been raised.

Dr. G. HUNTER read a paper on the diazo-reaction of urine in measles. He described the difficulties of the technique and showed that 85 per cent. of the colour obtained was due to histidin.

[1] See THE LANCET, 1922, i., 1039.

ON THE STATE OF THE PUBLIC HEALTH.

THE WORK OF THE MINISTRY OF HEALTH IN 1921.

THE annual report[1] for 1921 of the Chief Medical Officer of the Ministry of Health is a volume of 115 pages, issued at 1*s.* 6*d.*, while the third annual report[2] of the Ministry of Health 1921–22, the publication of which immediately preceded, costs 6*s.* for 166 pages. The comparison indicates some measure of return to an intelligent view of the important educational value of health reports, and of the need for encouraging their sale, even at a financial loss. Sir George Newman's annual report, furthermore, illustrates well the advantage of personal authorship of a public health report, especially when the author possesses his power of popular exposition. The report is thoroughly readable, and gives a clear bird's-eye view of the multifarious activities of the central department of health. It is a misfortune for Scotland that no corresponding personal annual report appears from the pen of Sir Leslie Mackenzie.

The present report follows the lines of its predecessors, but several references are made to the curtailment enforced on grounds of economy. The introductory chapter emphasises the principle, now happily securing more general recognition, that the application of the principles of preventive medicine for the welfare of the State necessitates an organisation of the whole art of medicine, on its curative as well as its preventive side. In securing this result, there are concerned not only central and local health authorities, but also voluntary societies and agencies having the same object in view, as well as the medical profession, and an educated public. With the local authorities "rests the main business of the execution of a national health practice." The purchasability of public health, in Hermann Biggs's words, is quoted, and the need for adequate but economical expenditure rendering full interest is stressed.

Expenditure on Health.

A footnote on p. 8 gives an interesting comparison of the amount of rates devoted to various purposes. Of the total rates in 1919–20, 20·4 per cent. went to education, 17·0 per cent. to highways, 13·7 per cent. to relief of the poor (not including lunacy), 7·9 per cent. to police and administration of justice, 21·9 per cent. to all health purposes, and 18·7 per cent. to other services. Of the 21·9 per cent. devoted to health, 17·1 per cent. was for sewerage, water-supplies, hospitals, vaccination, 3·7 per cent. for lunacy and mental deficiency, and 1·1 per cent. for maternity and child welfare, tuberculosis, and venereal diseases. Thus the three special services on which there has been much irresponsible comment, account only for about 1 per cent. of the local rates. All hygienists will agree with Sir George Newman's animadversion on the inexpediency of "stunts"—i.e., spasmodic and interrupted effort in one or other direction, which does not embody a settled policy, and an ordered sequence of action.

Death-rates.

On the sketch of the chief vital statistics we need not dwell, though we recognise their utility in anticipating the fuller information given in Dr. T. H. C. Stevenson's reports to the Registrar-General. The paragraphs dealing with the relatively small improvement experienced in life-prospects at the higher ages are interesting, though we should have liked to see a fuller study of this problem. The more favourable experience of Sweden at these ages may, as appears to be hinted in the report, be associated with the diminished consumption of alcoholic drinks, secured in that country under the Gothenberg system. Mention is made in the same connexion of continuing unsatisfactory, although improving, conditions of industrial labour, and of the value of the physiological test of condition of ventilation, which Leonard Hill's work has supplied.

Sickness and Invalidity.

The principal causes of physical inefficiency in our midst, the common non-notifiable diseases are almost entirely unmeasured and unregistered. Thus at the routine inspections of school-children in 1921, approximately 40 per cent. of the children were found to be defective, apart from the acute infections of childhood. The returns under the National Insurance Act from approved societies show for some 12 to 13 million people a loss of 14,476,000 weeks' work during the year, or 278,000 years. The financial loss to the community implied in these figures is very great. It is a significant fact that in order to obtain a fuller analysis of the causes of sickness among the insured, it has been necessary to make a sample investigation. Presumably the routine returns from all practitioners are unavailable or are not sufficiently accurate for this purpose. The sample records which have been analysed show that among the 36,325 persons whose illness was investigated, only 1·4 per cent. had tuberculosis, while 21·3 per cent. had bronchitis. The proportion is fundamentally different in actual life; and the figures speak eloquently of the need for closer coöperation between panel doctors and tuberculosis officers.

Infant Mortality.

In the section on this subject attention is drawn to the table in the appendix, which gives for each county and county borough the number in proportion to 1000 registered births of cases of ophthalmia neonatorum, of still-births, and of legitimate and illegitimate infant mortality. These rates form "a measure of the sanitary success or failure of the authorities concerned." In a footnote is given a brief description of a method of paying midwives for antenatal supervision, adopted in Bedfordshire, the progress of which will be watched with interest. In the next paragraph it is definitely stated that "the Ministry do not desire treatment to be given at the ordinary infant welfare centre, the main function of which should be the supervision of the healthy infant and the education of the mother." This is the ideal; but the infant is commonly in a state of uncertain equilibrium, with frequent functional disorders; and the entire prohibition of minor medical treatment at the centres—which is not intended—would deprive them of much of their value.

Insurance Medical Service.

Sir George Newman expresses the optimistic view that "from a medical point of view the principal necessity of this service is a period of composure free from frequent modification and administrative change." But were this statement to be amplified, it would doubtless emphasise the necessity for closer coöperation between insurance doctors and the public health service, especially in the case of maternity and the care of tuberculosis and venereal disease; and it would describe the necessity for improved access to hospital treatment and to consultative expert facilities for insured persons, as well as general provision for the skilled nursing of acute cases of illness treated at home. It is noted that in no area can an insurance doctor have more than 3000 insured persons on his list, and that in many areas the maximum is from 2000 to 2500. About 34 per cent. of insurance doctors have less than 600 patients each on their list, another 30 per cent. have between 600 and 1200 each, and only about 14 per cent. have upwards of 2000 each, and many of these have partners or assistants. The regional medical staff of the Ministry have made some 9000 visits to practitioners for the purpose of record inspection. It is also stated that most of the clinical records now required are proving to be of great value. The brief sections of the report dealing with general epidemiology and with infectious diseases introduced from abroad do not call for special comment.

[1] The report was the subject of a leading article in THE LANCET of August 5th, p. 283.

[2] THE LANCET, July 29th, p. 237.

Tuberculosis, Venereal Diseases.

Tuberculosis.—After stating that notification of tuberculosis still remains incomplete and delayed, attention is drawn to the encouraging feature found in many areas, where medical practitioners seek the assistance of the special machinery provided under tuberculosis schemes. Thus in Lancashire as many as 70 per cent. of the new cases, not including contacts, were sent to the tuberculosis officer for his opinion before notification. It is encouraging also to find that tuberculosis officers are being pressed to eschew the methods of an out-patient department, and to cultivate more examination of contacts and more preventive work, especially in the direction of home visiting by the tuberculosis officer. The cessation in May, 1921, of sanatorium benefit under the Insurance Act involved the transfer of insured tuberculosis patients for treatment under schemes of the councils of counties and county boroughs, on the same basis as the ordinary civilian population; and it may be expected that the cessation of dual control will secure more efficient control of this important disease. It is unfortunately necessary to record that "in a considerable number of counties and county boroughs care committees have not yet been established."

In *venereal diseases*, as in tuberculosis, the "great majority of medical practitioners fail to take advantage of the facilities offered under the venereal diseases scheme." Nevertheless good work is being done, and we entirely concur in Sir George Newman's statement that it is "necessary for the authority and the public to be guarded and circumspect in their criticism of the effectiveness or otherwise of these clinics, either as a whole or in respect of any particular patient."

Milk and other Matters.

The Ministry during 1921 have licensed 23 "certified" producers and 44 retail distributors of "certified" milk, 15 producers of grade A, and 5 retail distributors of certified and grade A milk, and 6 of grade A milk. Experience appears to confirm the importance of bacteriological standards in controlling cleanliness of milk production. Evidently, however, these provisions leave the vast majority of the public unprotected, and it is for them that efficient control of the milk-supply is required.

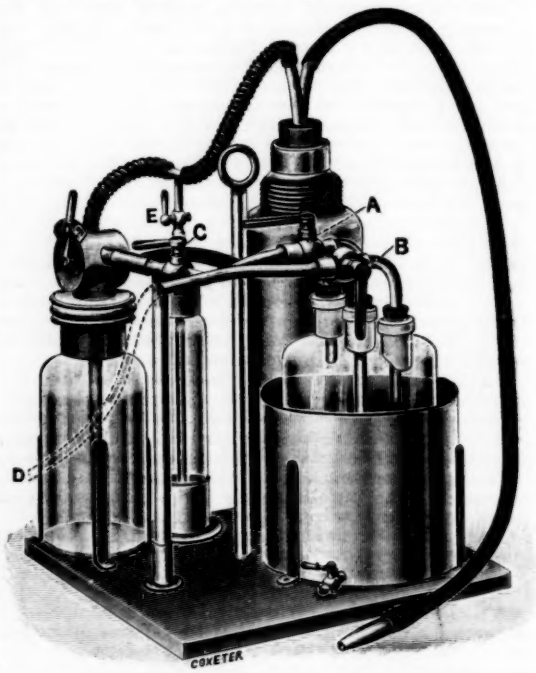
Among other subjects noted in the report are port sanitary control, local sanitation, the sanitary officers' order, the abatement of smoke and noxious vapours, and water-supplies. It is satisfactory to note that arrangements have been made for the systematic inspection of all Poor-law institutions "at reasonable intervals." The lack of arrangements for this supervision is one of the most urgent evils of the Poor-law medical service.

Liaison arrangements with the Medical Research Council have been maintained, and a brief note is made of a number of special scientific investigations undertaken on behalf of the Ministry. A final note deals with the international work of the Ministry.

New Inventions.

A SIMPLE COMBINED WARMED ETHER, CHLOROFORM, AND INTRATRACHEAL APPARATUS.

As shown in the accompanying illustration, this apparatus consists of a stand, with suitable handle for lifting, supporting a jacketed three-neck Woulfe bottle for ether or ethanesal, a chloroform vessel, a mercury blow-out, and a spiral worm in a thermos flask. Air can be pumped by foot or hand bellows, or oxygen sent from a cylinder with a fine adjustment valve, either over or through the contents of the bottle, depending on whether tap A or B be open. Any strength of vapour can thus be obtained, 5 per cent. with the blow over, and cold water in the jacket, and 20 per cent. with the blow through. By varying the apertures of both cocks any intermediate percentage results. Greater concentration is obtainable by surrounding the ether or ethanesal bottle with hot water. This is rarely needed. With the two mentioned taps closed and C turned on, air or oxygen is delivered direct and at any desired pressure, which is regulated by the mercury blow-out. The controlling tube slides in a collar, and is marked at 10 and 20 mm.; the latter is correct for most intratracheal administrations. The blow-out can be cut off by closing tap E. With the indicator on the chloroform bottle pushed over to "on," the air or



oxygen bubbles through the chloroform; with A and B also "on" the ether vapour does the same, part will do so and the rest pass straight on with C slightly open. The vapour passes through the worm in the thermos flask; the latter is filled with boiling water, which raises its temperature. The delivery tube is of special thick rubber, so as to prevent loss of heat in transit. The tube can discharge into the usual Skinner mask, or be connected to an air-way, such as the one I described in THE LANCET three years ago,[1] or it can be joined on to an intratracheal tube. It will slip over the ends of most tubes; for others, a coned adaptor terminal is provided. It can likewise be fixed to a nasal tube for mouth operations. The contrivance has the advantage of simplicity, and admits of any strength of anæsthetic. The knowledge that oxygen can be immediately turned on in lieu of the anæsthetic gives confidence.

I have used this apparatus for nearly six years and have previously described it without the chloroform attachment.[2] Many friends have expressed a wish to obtain one; the original was of my own manufacture. Messrs. Coxeter have placed it on the market and it can be obtained from any of the surgical instrument dealers.

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[1] Sold by Messrs. Barth, Poland-street, and described in THE LANCET, 1919, i., 1068.
[2] Journal of the R.A.M.C., February, 1919; Quarterly Supplement of Anæsthesia of the American Journal of Surgery, January, 1921.

THE LANCET.

LONDON: SATURDAY, AUGUST 19, 1922.

The Use of Isolation Hospitals.

THERE are now in England and Wales over 1000 fever hospitals with an aggregate of more than 37,000 beds, the vast majority of which are allotted to cases of scarlet fever and diphtheria. Typhoid and cerebro-spinal fever cases are admitted as they occur, and the beds reserved for small-pox are sometimes used for tuberculosis or convalescing scarlet fever, but practically speaking, nearly one-quarter of urban public health expenditure is on hospital treatment for scarlet fever and diphtheria. To take the most recent figures, last week's return from the M.A.B. Fever Hospitals gives a total of 4619 patients, classified as follows: diphtheria 2357, enteric 22, measles 138, puerperal 14, scarlet 2046, whooping-cough 13, other diseases 29. Now to keep a child, whether severely ill or not, in hospital for a period of four weeks costs something over £12, and the ratepayer may quite properly inquire whether he is well served by an expenditure of 1*s.* 4*d.* a head per annum on the simple isolation of all cases of scarlet fever, when the case mortality of scarlet fever in the metropolitan hospitals has gone down from 10 per cent. in the 70's to less than 1 per cent. at the present time, the actual mortality being only 38 per million in 1920. Were this reduction in death-rate attributable to isolation, it has been well worth the expense in the past, but for the present there are other and more urgent claims on beds. The question whether the best use is now being made of hospitals for isolating fevers was the subject of a suggestive communication to the recent Congress of the Royal Sanitary Institute by Dr. W. ALLEN DALEY, medical officer of health for Blackburn. The influence of these hospitals on preventing the spread of scarlet fever is presumably small, for children have generally infected other members of the household before removal to hospital. In regard to diphtheria the position is different, for the value of the hospital lies in treatment rather than isolation. Diphtheria remains a grave disease and hospital treatment is necessary for it, as for the many cases of measles and whooping-cough which develop serious complications. From the Registrar-General's recent return we learn that for the year 1920 the death-rate per million living was 191 in the case of measles and 117 in the case of whooping-cough, compared with 150 for diphtheria and 38 for scarlet fever. The subject was before the recent annual meeting of the Metropolitan Branch of the Society of M.O.H.'s, who decided to memorialise the M.A.B. on its traditional policy of admitting mild scarlet in preference to severe measles and whooping-cough, when accommodation is not sufficient to receive all the patients. We do not suggest that the sanitary authority should or could undertake the isolation of all infectious disease in its area, but that its utility would be greatly enhanced if it undertook to deal with selected cases of all kinds, putting in the forefront those from institutions and very poor homes, the new cases in a locality, and all those of severe type. Apart from the question of segregation there is the indisputable advantage of medical and nursing skill in the saving of individual life, which is observed particularly in severe measles and whooping-cough.

From the administrative standpoint, difficulties arise from increasing the variety of infectious cases admitted to the hospital. Under the present system these difficulties are already very considerable, as a large number of patients reach the receiving room when diagnosis is in doubt, and a carrier may at any time start a secondary infection in a ward carefully set apart for one type of disease. For these reasons the ideal to be aimed at is the isolation of the patient not only from susceptible persons outside the hospital, but also, so far as may be necessary, to prevent the spread of contagion to other patients in the hospital, even if supposed to be suffering from the same disease. The various means of putting this in practice are set forth in an admirable chapter entitled Measures for the Prevention of Cross-infection in the second edition of Parsons's "Isolation Hospitals,"[1] partially re-written by Dr. R. BRUCE LOW, who, like his predecessor, did not live to see the completion of his labours. An attractive method of solving this difficulty of cross-infection is that of so-called bed-isolation, introduced in the first instance at Fazakerley Hospital by Dr. CLAUDE RUNDLE, and we print this week a record of his recent experience along with similar results obtained at Plaistow Hospital where Dr. DONALD MACINTYRE has carried on the work started by the late Dr. J. BIERNACKI in 1912. The conditions under which bed-isolation is successful are carefully set out in these articles. The essential point is, that while patients can talk to each other there is no other communication of any kind between them. The precautions may sound rigorous and even harsh from the patients' point of view, and for this reason only children under 12 years of age are admitted at Plaistow to the ward. But in practice the children do not appear to feel the lack of toys, and the lively conversation from one end of the ward to the other testifies to their contentment. On the part of the nursing staff the precautions are simple. The nurse works with bare arms and covered hair, wearing a gown hanging by the patient's bed whilst attending to that patient, and thereafter straightway washing hands and forearms in running water.

Dr. LOW remarks in his book that one of the conditions of success in bed-isolation is a specially trained staff of nurses. Dr. RUNDLE and Dr. MACINTYRE make it quite clear that in their experience administration presents no difficulty. Success assumes a highly trained and enthusiastic sister, but probationers soon pick up the method. Judging by the results at Fazakerley and Plaistow, a high degree of precision has been achieved. Of 482 cases treated at the latter during the past three years, cross-infection resulted in seven cases only. At Fazakerley, out of a total of nearly 600 infectious cases of all kinds only one cross-infection with chicken-pox developed. Free ventilation is an important factor. Windows are kept widely open and both patients and nurses must be warmly clothed. But a high standard of ventilation and of conscientiousness in nursing are of value in themselves, and the extra time and attention required seem but a small price to pay for a system which makes it possible for any sanitary authority to treat within small compass all the infectious cases in the area which need special care. The experimental stage is past, and the time has come for general reform along the same lines.

[1] Isolation Hospitals. By H. Franklin Parsons. Second edition. Revised and partly rewritten by R. Bruce Low. Cambridge University Press. 1922. Pp. 281. 25*s.*

Diabetes: Successful Results of New Researches.

THE fact that the pancreas is connected with sugar metabolism cannot well be doubted, since the extirpation of the whole gland, as was first shown by v. MERING and MINKOWSKI, always causes the death of an experimental animal from severe diabetes in a very few days. Further, it is known that the amount of pancreas which is required is very small, since F. M. ALLEN has shown that it is necessary to remove seven-eighths of the gland in order to produce even a mild form of diabetes mellitus. The evidence that the pancreas is a double gland with an internal and external secretion is not so good. The relation of the islands of Langerhans to diabetes mellitus is one which has been much discussed. These are thought by some observers to be mere continuations of the acinous portion of the gland and not definite entities; but the work of E. L. OPIE, A. WEICHSELBAUM, and the recent studies of M. A. LANE, R. R. BENSLEY, and ALLEN are all strongly in favour of their autonomy. The introduction of better staining methods has shown that the cells of the islands are of two kinds, the so-called α and β cells. These cells contain granules which stain differently from those of the acinous portion of the gland. Numerous blood-vessels have, moreover, been traced to the islands, which thus have an abundant blood-supply. Further, when a dog which has only one-eighth of its pancreas intact is overfed with starch or sugar the granules disappear from the β cells and a vacuole (hydrops of the cell) develops. The nucleus is displaced to one side and finally the whole cell breaks up. ALLEN thinks that, if the process is not pushed too far, the cell may recover. If the cells break up, the island decreases in size but does not disappear because the α cells remain intact and apparently unaffected by the overfeeding with sugar. Although this evidence convinces many observers, it has not convinced all. Thus, SWALE VINCENT, in his recent Arris and Gale lecture,[1] speaking of the internal secretions of the reproductive organs and pancreas, says: "In the pancreas I am not prepared to admit that the islets are organs sui generis, nor am I persuaded that the internal secretion of the gland is furnished solely by these structures." Hitherto the experimental evidence in favour of any internal secretion of the pancreas has not been very conclusive. A. H. CLARK showed that sugar could be metabolised if the heart of the diabetic animal was perfused with a fluid which had passed through the pancreas of a non-diabetic animal, and E. H. STARLING and C. A. LOVATT EVANS produced some effect with extracts of pancreas. From the clinical side no good results have been reported with any kind of pancreatic extract.

Recently F. G. BANTING and C. H. BEST,[2] working in Prof. J. J. R. MCLEOD'S laboratory in Toronto, have adopted an ingenious method of preparing the pancreatic extracts. It is well known that if the ducts of the pancreas are tied the acinous portion of the gland dies and is gradually replaced by fibrous tissue. The islands, on the contrary, do not seem to be affected at all by this procedure and the animal does not show any signs of diabetes. Similar effects occur when the pancreatic duct is injected with lamp-black and can also be seen in cases of chronic pancreatitis occurring in human beings. BANTING and BEST took advantage of this change in the following way. They tied the ducts of the pancreas of dogs and after an interval of seven to ten weeks removed the pancreas and made an extract of the chilled gland with a neutral solution. This extract, when injected into the veins of a dog whose pancreas has been completely removed, always causes a fall in the blood-sugar and a decrease in the amount of sugar excreted. The extract had to be given every four hours in order to keep the blood-sugar at the normal level, and was effective only when injected intravenously, being apparently inert when given per rectum. No mention is made of its action when given by mouth. The extract can be kept in cold storage without harm for about seven days and is not affected by a weak acid solution. But an alkaline solution, boiling, or incubation with a tryptic extract destroys its action. The action of fresh pancreatic extracts was then compared with those in which the acinous portion of the gland was atrophied. It was found that the fresh extracts also had the effect of lowering the blood-sugar and diminishing the sugar output, but always caused many symptoms of toxicity in the animals and also thrombosis of the veins; and the same unpleasant effects followed injections of pancreatic extracts prepared from the pancreas of animals which had been exhausted as much as possible by secretin injections. Quite recently they have prepared a pancreatic extract from a 5-month bovine fœtus and were able therewith to keep a depancreatised dog alive for 70 days. This experimental work thus offers a convincing proof of the existence of an internal secretion coming from the islands of Langerhans and should serve to satisfy those who doubted the microscopic evidence.

The question at once arises whether these extracts of the islands can be used for the treatment of diabetes and thus score a brilliant success such as occurred in the case of myxœdema. BANTING and BEST, together with J. B. COLLIP, W. R. CAMPBELL, and A. A. FLETCHER,[3] have already used the extract on seven cases of diabetes and report a definite improvement clinically. So far the details published have been meagre and only one case is given in any detail. The extract caused a fall in the blood-sugar and a decrease in the amount of sugar excreted. Although the extract was given twice a day intravenously for ten days the urine still contained sugar in amounts which varied from 7·5 to 45 g. in the day, in comparison with over 100 g. before the injections were given. The aceto-acetic acid in the urine, however, which was never large in amount, disappeared altogether. As soon as the injections ceased the blood- and urine-sugar increased again. Thus the results on human being with diabetes confirm those obtained in animal experimentation. But the difficulties to be overcome before the treatment can be at all widely used must not be overlooked. The process of preparation from an animal whose duct has been tied some seven weeks earlier and the fact that such an extract only suffices for the treatment of one completely diabetic dog for two to three days makes its preparation in sufficiently large amounts a hard problem. Moreover, since the extract must be given intravenously two or three times a day in order to keep the blood-sugar at its normal level the widespread application of the treatment in its present form is not very practicable. Mere problems of technique should, however, be amenable to solution by patient effort. The authors are to be congratulated on making a first-rate contribution to the correct understanding of the pathology of diabetes which may ultimately solve the treatment of the disease.

[1] THE LANCET, August 12th, p. 313.
[2] Jour. of Laboratory and Clinical Medicine, St. Louis, 1922, vii., 1.
[3] Jour. Canadian Medical Association, March, 1922.

"Shell Shock" and "Cowardice."

THE report of the War Office Committee of Inquiry into "Shell Shock" is a readable volume of over 200 pages, representing the labours of a select body of experts, military and medical, and embodying a series of unanimous conclusions derived from a consideration of the material furnished by a large number of witnesses from different ranks of the services and different grades of the medical profession. With many of these conclusions the physician, the soldier, and the intelligent layman will find himself in unqualified agreement; they do but repeat after the lapse of four years what most had begun to feel and say long ere the war came to its termination—that "shell shock" is an unfortunate misnomer, the conception having moved radically away from its original significance of concussion or commotion; that no new "disease" in a neurological or psychopathological sense emerged from the experiences of warfare, the older entities of neurasthenia, hysteria, and psychasthenia being to some degree replaced by the more modern terms of anxiety neurosis, conversion hysteria, anxiety hysteria, and compulsion neurosis, but the mechanisms of their production did not differ from those of civilian life; that "shell shock" covered a multitude of diagnostic sins, and provided a choice of loopholes for the unwilling combatant. Perusal of the report leaves us with the distinct impression that while agreement is reached where it was fully expected, the unsettled points are as far from final adjustment as ever. The somewhat acute difference between the military and the medical viewpoint, or, rather, between that of the extremists on the two sides, does not appear to have progressed in the direction of reconciliation, and the Committee itself seems in some respects to have avoided authoritative statement and to have taken refuge in generalities. In no respect is this more obvious than in the matter of the relation of "shell shock" to "cowardice."

According to the Committee, "in many cases it is extremely difficult to distinguish cowardice from neurosis, since in both fear is the chief causal factor," and they do not furnish us with criteria whereby to draw the distinction. A legal military witness remarked that in court-martial cases "shell shock" became a parrot cry as a defence; a psychological expert, on the contrary, declared that "after my first two or three courts-martial I found I was practically in every case giving evidence in favour of the man." Another medical witness went so far as to say that in frankness he was not prepared to make a decision between cowardice and "shell shock"; "cowardice I take to mean action under the influence of fear and the ordinary type of 'shell shock' was, to my mind, persistent and chronic fear." No systematic attempt appears to have been made to define cowardice, and without such preliminary agreement indecision was inevitable. In ordinary diction cowardice is usually understood, we should say, to be synonymous, negatively, with "want of courage," and, positively, with its overt expression in flight from the enemy or otherwise. Prof. G. ROUSSY of Paris, in his evidence before the Committee, said that in the face of danger or of fear "any man who can control himself is a courageous man, but he who gives way, runs away, or does certain other actions not esteemed worthy, is defined as a coward." To elucidate the matter further, certain generalisations as deduced from a considerable body of evidence in the report should be given due weight. Thus it appeared that "shell shock" cases were relatively unknown among the members of the original expeditionary force; they were seen in greater quantities during stationary trench warfare, in certain battalions as compared with others, at certain places rather than others; and with the big and successful movements of the summer and autumn of 1918 they were once more at a minimum. From quite another point of view it was stated repeatedly by different types of witness that fear was universal, so to say, and normal, and deeds of valour were done though the actor felt himself all through in an "awful funk."

When fear in greater or less degree is present, the reaction to it depends largely or entirely on the individual, who may either rise superior to it because of his own innate qualities, or because of the influence on him of inculcated morale—"collective courage," as it might be termed—or, on the other hand, succumb to it. Should he give way to fear consciously, and while still capable of doing otherwise, he is guilty of cowardice; but to maintain or hint that the war neurotic surrendered to fear voluntarily, and when still able to exercise self-control, is in our opinion gravely to misunderstand the pathogenesis of war neuroses. It has often appeared arduous, even to the well-informed, to draw a distinction between hysteria and malingering, but if the difference is to be substantiated it can only be by holding stoutly to the view that with the hysteric a motive is unconsciously at work which in the case of the malingerer is entirely conscious. Similarly, the coward consciously yields to a fear-stimulus the action of which in the case of the genuine war neurotic is confined to the realm of the unconscious. The problem, therefore, of differentiating clinically the latter from the former is no more easy than with the malingerer versus the hysteric, yet this is no reason for its abandonment. We accept without question the impressive evidence as to the apparent increase of "shell shock" cases in circumstances suggestively favourable to the cropping up of cowardice, in the sense in which we use the term, but we consider these circumstances identical with those calculated to bring an incipient neurosis to a head. In this connexion less weight, possibly, appears to have been attached by the Committee to the lucid and valuable evidence of Dr. BERNARD HART than we believe it deserves. Dr. HART stated with confidence that in all cases of true war neurosis one mental factor is so constantly met with that it may be regarded as the nearest approximation to a specific cause of which we have knowledge. That factor is an unconscious mental conflict between "duty" and the instinct of self-preservation, and the unconscious motive which will provide its solution leads directly to the development of a psychoneurosis. In his view the unconscious motive would seem to be a factor of the first importance, and its effects can be traced through the whole of the illness. It would be useless to deny the temptation of the coward to shelter himself behind the defence of "shell shock," nor are we inclined to minimise the often ill-concealed tendency of the neurotic consciously to exaggerate and, it may be, on occasion to simulate symptoms; notwithstanding these admissions the contention is sound, we believe, that the known infrequency of "shell shock" in those organically wounded and in prisoners of war points to the genuineness of the unconscious development of a neurosis, in the potentially neurotic, for *their* solution of the inward conflict to which all combatants must by the nature of things have been subjected.

In the turmoil of war differentiation of the coward from the neurotic may often enough be impracticable on superficial investigation, as the civilian malingerer may with difficulty be separated from the hysteric.

Preliminary scrutiny at the recruiting stage may fail altogether to aid the military authorities in the selection of human material likely to withstand strain and stress; but, putting all suspicious cases aside, and making every allowance for the scepticism of some who had to deal with poor specimens of humanity in strenuous times, we must still hold to the genuineness of the neuroses of war and the reality of their distinction from simple cowardice; they made their appearance in soldiers whose every action till then had been above reproach; they developed in the most unlikely subjects; in actual numbers they formed but a very small proportion of the total casualties of all the combatant nations.

Annotations.

"Ne quid nimis."

THE ÆTIOLOGY OF RICKETS.

DESPITE the considerable number of able investigators of all nations who have applied themselves to the work, few current problems can display such incomplete and conflicting results as those presented by the ætiology of rickets. The report which we print of a discussion on this subject at the British Medical Association provides ample evidence of this: there is little common ground to be found among the opinions there expressed. Results, definite enough in themselves, appear to be swamped in a sea of hypotheses, from which two facts stand out high and dry: first that the absence of an anti-rachitic vitamin is a potent factor; second, that it is not the only factor. The most important secondary factor appears to be the influence of lack of light. These two factors, vitamin and light together, will, we feel confident, go far towards filling up the blank pages of the ætiology of rickets. Prof. A. Harden even suggests that light actually causes the formation of vitamin-A. By a happy coincidence we are able to print in this issue a lecture by Prof. Alfred F. Hess, of New York, the chief protagonist of the light theory, which we commend to our readers' careful attention. An explanation is provided for the well-known fact that rickets is commoner in the poorer classes of the gloomy industrial cities, especially in the north, than in the equally underfed children of villages not robbed of light by a pall of smoke or mist. Dr. Hess and his co-workers are to be most sincerely congratulated on having carried out a remarkably valuable piece of work in a thorough way; and the work will, we think, stand the test of further advances. Though we believe that the anti-rachitic vitamin and the effect of light are the chief practical essentials to be borne in mind in the combating of rickets, it cannot be denied that, under laboratory conditions, some other factors must be included for further consideration and experiment. But here we are met with two difficulties not easily circumvented. In the first place, it is essential strictly to define exactly what rickets is: if we raise an animal with bent legs in consequence of removing calcium from its diet, clearly we cannot call that rickets, but a less glaring example might be included in the rachitic category. This may be the explanation of the diet-balance hypothesis ingeniously advanced by Prof. E. Mellanby—we think that further investigation will show a good deal to be said for this; but there remains the question of what constitutes an adequate amount of vitamin-A under various conditions.

In the second place, judgment needs to be exercised in applying to the human subject the results of experiments on animals. Sheep, pigs, rats, and puppies have been used and the type of lesion produced and the factors requisite for their production might differ materially. Such experiments serve to frame and test hypotheses which can later be applied to human infants: the fact that rickets is associated with active growth is too often forgotten in animal experiments. With regard to the theory that a specific virus is responsible for the causation of rickets, we cannot believe that such a hypothesis, opposed as it is both to clinical and to laboratory facts, was mentioned with any seriousness by the speaker. An important point was raised by Prof. Noël Paton in the discussion, when he challenged the statement that butter was classed as of equal value with cod-liver oil. It would seem that the vitamin-A is not wholly and solely an anti-rachitic vitamin—it may be a mixture, that of cod-liver oil being richer in the anti-rachitic factor, while that of butter is potent in preventing kerato-malacia. The same speaker's view that the energy content of the diet is important, is hard to reconcile with many known facts; we think that we cannot be dealing with the same pathological condition as rickets, when mere increase in the caloric value of the diet will set things right.

It would seem, therefore, that there is a disharmony of opinions on the subject because the protagonists of each opinion tend to regard the problem as capable of one simple explanation, which varies in each case. From a discussion which has developed some heat we may also expect light to arise. The most reasonable position is surely that taken up by Dr. Hess, that there are two chief factors at work in producing rickets, lack of anti-rachitic vitamins and lack of ultra-violet light. The issue is further obscured by the obtrusion of other factors which modify the operation of the two main ones, and also, and to a very considerable extent, by lack of unanimity regarding the pathological anatomy of rickets.

REFUSE TIPS.

THE elementary method of disposal of refuse by depositing it upon tips is apt to give rise to offence in many ways. In Manchester a recent report credits its tips with the local prevalence of septic conditions such as erysipelas. A tip becomes the breeding ground of flies, rats, and other vermin; the decomposition of organic matter may cause unpleasant smells. Perhaps the most serious drawback to this system of refuse disposal arises from the liability of the tips to smoulder and emit foul-smelling smoke and vapours. Efforts to extinguish tip fires are rarely successful, even when they include attempts to cut off the burning portions by digging trenches which are subsequently filled with earth; the labour involved is costly, and is not without danger to those engaged upon the task. Moreover, those responsible for burning tips not infrequently find themselves faced with the prospect of expensive litigation set up by aggrieved parties. Local authorities should therefore welcome a series of suggestions submitted to them by the Ministry of Health in a recent circular. The circular does not suggest that the method of refuse disposal by tipping can ever be regarded as a satisfactory one, but, in the opinion of the Minister, the nuisances associated with tips may be, to some extent, prevented by careful management. The precautions recommended are that the refuse should be deposited in shallow layers, each layer being promptly covered with earth or other suitable material. The depth of any stratum of refuse should be not greater than 6 feet, and the covering layer should at least be 9 inches in thickness. No refuse should be left uncovered for more than 72 hours from the time of deposit; if the material deposited at any one time consists entirely or mainly of fish, animal, or other refuse, there should be no time allowance, the material being covered forthwith by earth or other suitable substance to a depth of 2 feet. Covered layers should be given time to settle before further layers are superimposed. Tipping refuse into water is likely to give rise to nuisance, and should be avoided. Persons making deposits should take all reasonable precautions to prevent the breaking out of fires and the breeding of flies or vermin. To these precautions we would add an instruction that tins and other

hollow receptacles should be crushed flat before being deposited, for it has been found that otherwise, there is a tendency for a layer of such containers to act as air shafts conveying oxygen to the fires; while buried tins also function as dwellings for rats. The circular suggests that screens or other apparatus should be provided to prevent paper or other débris from being blown away by the wind; this is a necessary precaution, for cases are known in which the country for miles around a tip has been littered with dirty papers. With a view to avoiding the unsightly mound tip the Minister suggests that depositors should avoid raising the surface of the tip above the level of the adjoining ground. The precautions suggested in the circular are eminently practical, and it is to be hoped that local authorities who practise tipping will carry them out, whether the work is done by their own workmen or by contractors. The extra expense involved will have been wisely incurred if it results in the prevention of costly fires and other nuisances which at present are all too common in connexion with this system of refuse disposal.

THE LABORATORIES AND HEPATIC DISEASE.

IN our review columns this week we notice a volume dealing with the work of the late Frantz Glénard. Known throughout the medical world for his descriptions of visceroptosis, this physician, during the last 20 years of his life, devoted himself to the clinical study of hepatic disorders. Although relying solely on the ordinary methods of clinical observation, Glénard was able, by tracing the histories of the numerous invalids visiting Vichy each year, to acquire an experience in this group of diseases which few have excelled. It is impossible definitely to accept or reject opinions formed in such a manner, but all clinicians will read his views with respectful interest, and it is a matter for regret that such an observer was deprived of the aid which the chemical laboratory now affords to workers in this field. Some time ago we reported[1] briefly an address by Sir Humphry Rolleston on the bearing of recent physiology on diseases of the liver, in which he dwelt on the differentiation of jaundice due to disordered function of the liver cells from true obstructive jaundice. Several tests are now being employed by biochemists in making this distinction, probably the most important being that associated with the name of Hijmans van den Bergh, of Groningen. In this test[2] some 5 c.cm. of blood is withdrawn from the patient and centrifuged, 1 c.cm. of the serum so obtained being tested by the addition of 1 c.cm. of Ehrlich's diazo-reagent, which is prepared by mixing equal quantities of (*a*) sulphanilic acid, 1 c.cm.; HCl conc., 15 c.cm.; distilled water to 1000 c.cm.; and (*b*) sodium nitrite, 0·5 g.; distilled water, 100 c.cm. A positive response to this test is shown by the immediate appearance of a bluish-violet reaction which reaches its maximum in about 30 seconds, such an immediate direct reaction indicating a true obstructive jaundice. If, on the other hand, this reaction does not appear for some minutes, the delay indicates a hæmo-hepatogenous jaundice probably associated with disturbed hepatic function. Sometimes, and especially in cases of "cardiac liver," there is a biphasic reaction in which a slight reddish colour appears immediately and slowly deepens to the violet tint. Cases giving only the delayed reaction can be better tested by the indirect method; in this the serum is treated with twice its bulk of 96 per cent. of alcohol, and centrifuged; to 1 c.cm. of the clear liquid are then added 0·5 c.cm. of alcohol and 0·25 c.cm. of the reagent; a violet-red colour appearing immediately indicates a hæmo-hepatogenous jaundice. The mechanism of these reactions is still obscure, depending, in the opinion of such workers as van den Bergh and C. M. Jones,[3] on alterations in bile-pigment metabolism, bilirubin being either free in the serum or loosely combined with albuminoid substances. The tests are being employed by Dr. J. W. McNee and other workers in this country, with results[4] of distinct practical value.

Many other tests of hepatic function are coming into use, the old tests for bile in the urine have been supplemented by reactions such as Ehrlich's diazo and aldehyde tests, and other methods chiefly designed for the detection of urobilin. Again, there are tests such as the "hæmoconia" test, used by French observers for demonstrating the presence of fat particles in the blood serum after a meal; and in France increasing interest is being shown in the hæmoclastic crises[5] described by Widal. Apart from these, tests are being elaborated for demonstrating the glycogenic function of the liver, one of these, in which the effect of the ingestion of lævulose on the blood-sugar was considered, was described by Dr. J. C. Spence and Dr. P. C. Brett[6] in THE LANCET last year. There is, in fact, an enormous amount of investigation now in progress which should have the effect of elucidating much that is at present obscure, and it is to the chemical laboratories that we must look for light on those difficult problems to which prophets like the late Frantz Glénard were continually pointing.

[1] THE LANCET, 1922, i., 908.
[2] H. van den Bergh: Die Gallenfarbstoff im Blute, Leiden, van Doesburgh, 1918.
[3] Jones, C. M.: Arch. Int. Med., xxix., 643, 1922.
[4] McNee, J. W.: Brit. Med. Jour., 1922, i., 716.
[5] THE LANCET, July 22nd, 1922, p. 191.
[6] Spence, J. C., and Brett, P. C.: THE LANCET, 1921, ii., 1362.

EXAMINATIONS IN DENTISTRY.

WE have received from Mr. Norman King, the Registrar of the Dental Board of the United Kingdom, the following revised table of the results of the first series

Tabulated Results of the Prescribed Examinations in Dentistry held during July, 1922.

		Manchester.	London.	Edinburgh.	Total.
Mechanics	Candidates	38	52	21	111
	Passed	31	39	16	86
	Failed — Part I.	2	7	—	9
	Failed — Part II.	4	3	5	12
	Failed — Parts I. and II.	1	3	—	4
Practitioners.	Candidates	13	37	5	55
	Passed	6	30	5	41
	Failed — Part I.	1	2	—	3
	Failed — Part II.	4	4	—	8
	Failed — Parts. I. and II.	2	1	—	3
War Service	Candidates	14	45	9	68
	Passed — Whole exam.	8	32	7	47
	Passed — Part I. only	4	5	1	10
	Passed — Part II. only	1	4	—	5
	Failed	1	4	1	6
Totals	Candidates	65	134	35	234
	Passed	45	101	28	174
	W. S. candidates for re-examination	6	13	2	21
	In Part I.	4	5	1	10
	In Part II.	1	4	—	5
	In Parts I. and II.	1	4	1	6

of examinations which took place last month, with a request that it should be substituted for the table which appeared last week. Part I. of the examination includes the written paper and the oral and Part II. the Practical Examinations in Operative Dentistry and Dental Mechanics.

ADMINISTRATION OF THE SALE OF FOOD AND DRUGS ACT IN SCOTLAND.

THE Scottish Board of Health state, in their recently issued report on the administration of the Sale of Food and Drugs Act for the year ending Sept. 30th, 1921, that most of the local authorities in Scotland devote a good deal of attention to sampling and analysis. It is noted, however, that in some localities only a few articles are sampled; in a few instances milk alone is subjected to examination, whilst in

some areas sampling is only carried out on one or two days in the year. These observations apply neither to the large centres of population, nor to the more important county areas. The total number of "formal" samples—i.e., those taken with the formalities of the Act, concerning which legal proceedings may be instituted—purchased during the year was 6327 of which 514 (8·1 per cent.) were reported as adulterated or not up to standard, including 19 "of doubtful purity." In 1920 the samples submitted numbered 6430, of which 591 (9·2 per cent.) were reported against. Amongst the foodstuffs to which detailed reference is made "egg-powder" is instanced as an example of the need for the labelling of composite foods. Dr. J. W. Tocher, public analyst for Aberdeenshire, reported that the average composition of nine samples submitted to him at intervals during nine months, expressed in percentages, was as follows:—Ether extract, 1·2; albuminoids, 3·6; moisture, 12·8; raising agents: sodium bicarbonate, 9·0; potassium hydrogen tartrate or tartaric acid, 9·5; starch, 63·9. "These results," writes Dr. Tocher, "show that the powders contain none of the constituents of eggs, and that therefore the title 'egg-powder' is a misnomer. It is well that the public should know the composition of such 'egg-powders' so that purchasers may not be misled into thinking that the powder is in any sense an article of food." He adds, however, that although the statement that "egg-powder is the only real substitute for eggs" is not warranted from the results of analysis, the "egg-powder" may possibly be quite useful as a raising agent, or for other cooking purposes. With regard to drugs, 191 samples were analysed during the year, 11 of which were reported against, two of these being "of doubtful purity." Of the 191 samples, 118 were of cream of tartar. Only 73 samples of other drugs, therefore, were taken throughout Scotland—a figure which, the Board points out, reveals very insufficient sampling. With regard to test samples—i.e., samples taken informally with a view to locating where adulterated articles are sold—it was observed that, as in former years, the percentage of adulterated milk found was much higher in test samples than in formal samples. The attention of the Board was drawn to the varying proportions of cod-liver oil in mixtures or emulsions containing that article. An analysed sample of malt extract was shown to contain 2·82 per cent. of oil; according to the British Pharmaceutical Codex, emulsio olei morrhuæ should contain 50 per cent., and extractum malti cum oleo morrhuæ 15 per cent. of cod-liver oil. On referring the matter to the General Medical Council the Board were informed that the question of inclusion in the British Pharmacopœia of an emulsion of cod-liver oil and of an extract of malt and cod-liver oil would be considered either during the preparation of a new pharmacopœia or when an addendum to the Pharmacopœia was next made. A representation made to the Board with reference to zinc containers in ice-cream freezing machines elicits the information that no cases of zinc poisoning have been brought to the Board's notice in this connexion, but that slight contamination of ice-cream in the manner suggested appears to be possible. The Board are considering the matter, which at present can only be dealt with indirectly—i.e., prosecution in event of the sale of ice-cream containing sufficient zinc to endanger health. The report also contains a tabulated abstract of the reports of public analysts for the year regarding samples taken with legal formalities.

MEDICAL ACTIVITY IN RUSSIA.

THE Russian Fifteenth Surgical Congress is announced to take place at Petrograd between Sept. 25th and Oct. 1st of this year. The Pirogoff Surgical Society of that city has now made an official announcement of the fact, through the President, Prof. J. Grekow. The Organising Committee consists of the Council of the Pirogoff Surgical Society, Prof. Grekow, Prof. Oppel, Prof. Janowsky, Dr. (Docent) Melnikoff, and Dr. (Docent) Lissizin, in collaboration with members of the Surgical Society: Prof. Turner, Prof. Wreden, Prof. Schewkunenko, Prof. Rokitzky, Prof. Poljenoff, Prof. Girgolaff, Prof. Schaack, Prof. Dshanelidze, Prof. Cholzoff, Dr. (Docent) Smirnoff, Dr. (Docent) Hesse, Dr. Petraschewskaja, and Dr. Manniloff.

The principal subjects set down for discussion are:—

1. Anatomy and Pathology of the Vascular System. Communications here will be made by Prof. Schewkunenko: The Architecture of the Blood-Vessels; Prof. Krawkow: Functional Changes in Blood Vessels of Isolated Organs in Different Diseases; Prof. Anitschkoff: Pathology of the Arterial Wall; Prof. Lang: Pathology and Therapeutics of Vascular Tonus; Dr. (Docent) Kurschakoff: The Peripheral "Arterial Heart"; and Prof. Oppel: Gangræna Arteriitica Suprarenalis.
2. Chronic Ulcer of the Stomach. Communications will be made by Prof. Martynoff and Prof. Grekow.
3. The Surgical Complications of Exanthematic and Recurrent Fever. Communication by Dr. (Docent) Hesse.
4. The Treatment of Surgical Tuberculosis. Communications by Prof. Spisharny and Prof. Wreden.
5. One day will be devoted to questions of urology.

The discussions will be held in joint session with the Medical Congress which will take place at the same time.

Accommodation will be provided for foreign visitors to the Congress, and steps taken to secure lodgings, food, and reduced railway fares. A meeting of welcome is to be held on Sept. 24th. All communications should be made to the secretaries of the Surgical Society: Dr. (Docent) Melnikoff, Petrograd 33/35; F. Nishegorodskaja; and Dr. (Docent) Lissizin, Petrograd 30, 4, 6th Roshdestwenskaja.

HOSPITAL ADMINISTRATION IN NORTH AMERICA.

IN 1920 a conference of representatives of various groups, interested in public health and education, from parts of the United States and Canada, was summoned by the Rockefeller Foundation, with a view to the consideration of the supply of adequately-trained hospital administrators or "executives"—a supply made necessary by the increasing influence and complexity of public health work and by the growing importance of health measures in the eyes of the community. The conference appointed a commission on the training of hospital executives; this commission, after a thorough inquiry into existing hospital practice, organisation, and tendencies, has now presented a report containing recommendations concerning the training necessary and the means of attracting the type of worker required. The report states that the growth of a sense of community responsibility in matters of health is creating a demand for leadership from the professional groups now identified with health activities; the rapid development of sound health policies is the primary necessity, but problems remain essentially local and practical, not general and theoretical, and attempts to superimpose artificial programmes and standards are illogical. It is pointed out that a majority of the crippling and killing diseases do not readily admit of even the most efficient community control, and attention is now becoming concentrated on the home. Medical and nursing education is still largely a training in handling individual problems. Specialisation, although necessary for the advancement of knowledge, for teaching, and for a proper division of labour, has left uncovered a large field of essential activities, and as a result appears a certain amount of divided and uncertain pseudo-scientific opinion amongst public health workers.

The hospital is, thus, felt to be the strategic mid-position where the professional worker, the patient, and the community meet on common ground. The hospital, that is to say, becomes not only an institution for the salvage of human wreckage, but a point of coördination of health activities, professional, economic, and social. At present there are between

seven and eight thousand hospitals of over 10 beds in the United States, with a total bed capacity of almost 700,000. About 70 per cent. of all these hospitals are in communities of 50,000 or less; 56 per cent. of the counties of the country have no hospital facilities. The functions of the hospital are defined as (1) provision of the highest possible health service to patients, professional groups, and community; (2) education of the community as a whole to demand adequate health service and sound health policy and education of additional personnel and professional groups in technical directions; (3) advancement of knowledge of disease and its prevention through technical research. These functions are common to all hospitals, apparent differences between institutions being matters of emphasis or of special forms of service.

The chief function of administration is, we learn, to create an environment conducive to the highest efficiency of performance of these functions—that is, to relieve the professional staff as much as possible of non-technical duties, and to systematise and carry out the maintenance of buildings and grounds, the purchase and handling of supplies and stock, the housekeeping, records, office management, and coördination of the duties of the medical and other professional staffs. "The present somewhat general conception of a hospital as a hotel for the sick with the superintendent an exalted steward or clerk, with little voice in shaping policies and less responsibility in suggesting them, does not attract executives of the grade suggested." Several hospitals, it is stated, have set up more or less formal training for superintendents, particularly for graduate nurses, but as yet no provision for this education on a university basis has been made. Without attempting to set up a schedule of subject-matter necessary for a university course in this connexion, the commission give a list of major topics as a basis for qualification; the relative importance of the subjects is suggested by a percentage figure, as follows: (1) public health, 20; social sciences, 15; organisation, 15; hospital functions and history, 10; business science, 10; institutional management, 10; personnel administration, 5; community hospital needs, 5; physical plants, 5; jurisprudence, 5. Nine months is indicated as a suitable period for the theoretical portion of the course, to be followed by six months' practical work, of which the first four months should be spent in one hospital and the remaining two should be occupied in visiting institutions of different types. A final period of conference and discussion is suggested. The whole course would not produce a "finished hospital executive," but would give a reasonable grounding for future development. Advanced training in administration should be largely in the nature of original work and investigation. It is plain that provision for and production of a highly trained class of hospital administrators would go far to establish the position of the hospital as the fulcrum for the best possible type of coördinated effort in the raising up of public health.

THE ÆTIOLOGY OF LOOSE BODIES IN THE KNEE-JOINT.

THE cause of loose bodies in the knee-joint has long been a subject of discussion, more particularly among continental writers. König, Büdinger, Kappis, and Barth have contributed to the discussion, and Prof. G. Axhausen now publishes the results of recent investigations made by him along clinical, experimental, and pathological lines. In discussing the varieties of loose bodies that may be met with in the knee-joint, he recognises those which are undoubtedly traumatic in origin, and describes them as being characterised by their complete or almost complete limitation to the articular cartilage. Büdinger reports radial or network fissures of the cartilage, and Kappis peeling off of large or small flakes of that structure from the subchondral bone. Only very exceptionally does the cartilage carry away with it any of the underlying bone. Such injuries show very little tendency to heal, and the separated portion practically never unites again. In those cases only where there is extensive traumatic destruction of the cartilage does the regenerative power appear to be stimulated, and then only in form of fibrous cartilage. Prof. Axhausen states that it is easy to understand how the loosened bit of cartilage, which is circumscribed by the line of fissure, becomes cut off from the bone by young connective tissue, and as a result of repeated trauma or of the continued movements of the joint, loses its last hold and becomes a body loose in the joint. But he points out that there is another kind of loose body which can be recognised in its early stages, as well as in its last stage when it lies free in the joint cavity. It is characterised in its early stages by the presence of a wedge-shaped piece of necrotic subchondral bone, firmly attached to the overlying cartilage, but separated from the living bone, not by a fracture or fissure, but by a layer of granulation tissue. Barth accepts this as the result of a traumatic lesion, but Prof. Axhausen thinks such an occurrence must be extremely rare, and points out the improbability that a fracture would either make such a regular line as is always found or would be so frequently bilateral as occurs in these cases. He therefore seeks another explanation. He produced artificial fractures by chiselling out a small wedge-shaped piece of cartilage from the articular surfaces of the patella and of the femur and immediately replacing them. In 20 experiments on rabbits and dogs the fragments healed perfectly by the usual process common to all bones. No loose body was formed, and in no case was the curious picture that is found in cases of loose body produced. Prof. Axhausen draws attention to the similarity of the early picture of loose bodies with the small sequestra often seen in tuberculous joints, and suggests that in both the necrosis is produced by an embolic blocking of the vessels, with this difference: that in tubercle the infection is severe and continuous and produces other effects, whereas in the loose body the process causing the embolus is either a fleeting infection, which leaves no other effects, or some other unknown factor. He supports his theory by reference to similar conditions affecting other joints. An X ray picture of a shoulder-joint is reproduced, showing an area of necrosis, in which it is almost unthinkable that a wedge-shaped fracture could have taken place. In 1920 Koehler described a curious condition affecting the heads of the metatarsal bones. Clinically, pain and swelling in this situation was complained of, and radiographic examination revealed areas of thickening surrounded by a zone of rarefaction, flattening of the head, overgrowth of the articular edges, broadening of the neck, and eventually marked deformity. Prof. Axhausen had an opportunity of examining two such cases histologically. The encapsuled areas, which under the X ray looked like tuberculous sequestra, proved histologically to be wedge-shaped areas of necrosis, involving the epiphysis and a portion of the medulla. They were separated from the living bone by a layer of old and new granulation tissue. The cartilage was less damaged and covered evenly the necrotic portion and the rest of the epiphysis. No trace of tubercle was found. The condition closely resembled that found in the early stages of loose bodies, and the history quite definitely excluded the probability of trauma. Reference is made to Perthes's disease (osteo-chondritis deformans juvenilis). Histological examination of the head of the femur in this disease shows a similar picture of a wedge-shaped area of necrosis in which the cartilage is included, and Prof. Axhausen suggests that the cause is similar to that producing loose bodies, again the infection being a fleeting one. In all three conditions—i.e., loose bodies in the knee-joint, Koehler's disease, and Perthes's disease—bilateral incidence is not uncommon. In each case some lipping of the edges of the articular cartilages may occur. This is usually accepted as characteristic of osteo-arthritis, and it may be that osteo-arthritis itself is caused by some interference in the blood-supply to the joint. Prof. Axhausen makes it clear

that, although the result in each of these conditions is similar, it is so only because the damage is due to an embolic blocking of the vessels, and that the cause of the embolus may be very different in each case.

SOCIALISTS AND STATE MEDICAL SERVICE.

AT the thirty-sixth annual conference of the Social Democratic Federation held during the recent Bank Holiday there was a lengthy debate on Hospitals and State Medical Service. It is interesting to note that this, the oldest and parent socialist organisation, while approving of State action, recognises the many abuses that have arisen. This is not only the case with the hospitals of England, supported by voluntary subscriptions, but with the State hospitals of France based on the Laws of the 24 Vendemaire and the 22nd Floreal of the year II. of the Republic. In both countries people with ample means have availed themselves of the medical treatment intended only for the poor. Such conduct towards the medical profession was very much resented by the meeting, and warm expression was given to feelings of admiration and gratitude for the noble devotion and disinterestedness of many medical men. Further, considerable appreciation was shown of the difference between a profession and a business. The desire was expressed to prevent medical men becoming mere salaried employees, gaining advancement not by skill and devotion but by seniority or patronage.

Dr. Ellis Morgan, who opened the debate, said, however, that as it had been necessary to spend some £30,000 in collecting £300,000 to save the hospitals, it was evident something more was needed. A national State system would prevent much overlapping and waste of money. With a better medical service there would be less need of out-patient departments at the hospital, and more use should be made of the infirmaries for chronic cases, so as to reserve the hospitals for special cases. The feature of the discussion was the eagerness displayed by a body of political and socialist propagandists and agitators to understand the point of view taken by the medical profession, and their cordial recognition that the interests of the public and of the profession were identical. Above all, this group urged that the profession must be maintained as a profession animated with a high ideal and not degenerate into a mere form of employment with an increase of salary as its only reward.

STUDIES IN EXPERIMENTAL EPIDEMIOLOGY.

THE current number of the *Journal of Hygiene* contains two further reports on the studies in experimental epidemiology which have been carried out during the past four and a half years by Dr. W. W. C. Topley,[1] who has been assisted in this work by a special grant from the Medical Research Council. The results so far obtained, and the deductions drawn from them, may be briefly summarised as follows. It has been shown that different strains of *B. enteritidis*, when fed to mice, produce a very varying mortality among the animals so treated; while strains which fail entirely to infect mice when administered by the mouth may be fully virulent when tested by inoculation. A sharp distinction has been drawn between virulence and infectivity, the latter term being employed to denote those characteristics which will enable an organism to spread rapidly among a susceptible population, and to set up those initial lesions which lead on to tissue invasion. The conditions which govern the spread of infection, from infected to susceptible mice, have been studied from several aspects, and the following are the more important facts which have been elicited: 1. If, to an infected population, susceptible individuals be added at a constant rate, deaths do not occur regularly, but in a definite succession of waves. 2. Mice added during the rise of a wave rapidly succumb to infection. Mice added during the decline of such a wave live far longer. 3. The rate of extinction of an infected population is markedly increased by the addition to it of susceptible individuals of the same species. 4. The survivors from a given epidemic may continue in apparent health for long periods of time, but if considerable numbers of susceptible animals be added to them a fresh wave of mortality will occur. During this second wave the newcomers will be the first to succumb, but many or all of the survivors from the previous epidemic will die before the fresh wave subsides. 5. If infected mice be added to a susceptible population a pre-epidemic phase usually precedes the occurrence of a well-marked wave of mortality. This phase is marked by the occurrence of a few isolated deaths due to the infection in question, and by a rise in the death-rate from all causes. 6. If a population, which is in the pre-epidemic phase, be dispersed into several small groups, the subsequent total mortality will be greatly reduced, while the mortality demonstrably due to the infection in question will be reduced to a still greater extent. It is suggested that the results so far obtained indicate that "in every case in which a bacterial parasite, possessing potential pathogenicity, and a susceptible host-population coexist in a given area, it is probable that a condition of equilibrium is attained. It is disturbance of this equilibrium which leads to an epidemic of the disease to which the parasite gives rise." Since the presence of susceptible hosts, in sufficient number and concentration, has been shown to be essential for the spread of infection, the factor of immunity, as it functions in aggregates of individuals, and its variations during the progress of an epidemic, need careful study. It seems possible that the problems of epidemiology may yield to the experimental method, where other methods have failed because of the complexity of the uncontrolled conditions which obtain in epidemics as they occur in nature.

It is interesting to note that similar researches are in progress in America, of which an account is published in the *Journal of Experimental Medicine* for July, with a prefatory note by Dr. Simon Flexner. The papers themselves, by Drs. Clara J. Lynch, Leslie T. Webster, Harold D. Amos, and Peter P. Hazelbauer, are too long to summarise here, but the main conclusions reached are perfectly compatible with those of Dr. Topley, and therefore afford additional grounds for believing that this kind of research will yield valuable results.

[1] THE LANCET, 1919, ii., 1. Jour. of Hyg., 1921, xix., 350; xx., 103, 227; 1922, xxi., 10, 20.

BLOOD GROUPS IN ANTHROPOLOGY.

REFERENCE was made in our columns last week to the possibility of determining the paternity of a child by means of the incidence of blood groups in the individuals concerned. Blood groups, besides having a practical importance in law and in therapeutics, possess also a much wider, though more academic, interest by reason of the light that they may be found to shed on the problems of anthropology. That there is a definite racial variation in the incidence of blood groups was first shown in a paper published in THE LANCET by L. and H. Hirschfeld[1] in 1919. These observers took advantage of the heterogeneous character of the armies and their prisoners on the Macedonian front to conduct an extensive investigation of the racial distribution of the blood groups. They found on the whole that the factor producing group II. is prevalent among European peoples and that the factor producing group III. is commoner among men from Asia and Africa. As was mentioned in this journal last week the factors producing groups II. and III. are believed to be inherited according to the Mendelian law, and it has been suggested that the two factors may have been derived from human stocks which originated independently. It has been pointed out by Geoffrey Keynes[2] that incompatibilities of blood cannot be in any sense "protective," since transference of blood can never take place in the course of nature, nor

[1] THE LANCET, 1919, ii., 675.
[2] Blood Transfusion, Oxf. Med. Publications, 1922, p. 80.

have they any relation to other qualities. Blood groups have never, therefore, been subjected to any kind of artificial selection and racial incidence may be relied upon to give information which, as far as it goes, is accurate. Since the inheritance of the groups appears to take place according to the Mendelian law, it could be predicted that, in a small isolated community of known origin, their incidence would be found to be approximately the same as that among the population from which they originated. Similarly the populaton of a larger area might be expected to show roughly the same incidence as that of another area with which it had a common origin. It is interesting, therefore, to find that evidence bearing out these points begins to accumulate. In Germany a paper has been published by two Hungarian doctors, F. Verzár and O. Wezeczky.[3] They have investigated the incidence of blood groups among (1) the inhabitants of some villages near Budapest which were colonised by people from central Germany two centuries ago and have remained racially isolated ever since; (2) the Hungarian inhabitants of the town in which the investigators live; and (3) the true Hungarian gypsies, who wander through the country but remain racially pure. The figures in these three groups, though differing widely from each other, were in agreement with expectations based on anthropological and Mendelian theory. Those for the German colonists in Hungary were the same as if they had been taken in Heidelberg. The Hungarian figures closely approximated to those found among the Turks. Those of the gypsies were the same as are found among Indians.

Another paper of less importance has been published by Dr. J. H. Harvey Pirie.[4] This observer finds that the incidence of the blood groups among South African natives approximates to that found among some of the more Western races of Europe. It differs from that of West African natives, who are believed by anthropologists to be less impregnated with Mediterranean blood than the South Africans. The numbers tested by Dr. Pirie are at present too small to be conclusive, but they do at least suggest that blood groups may constitute a fruitful line for future anthropological research.

A MUSEUM OF WAR WOUNDS.

FROM the annual report of the Conservator of the Museum of the Royal College of Surgeons of England we learn that the Council of the College has become the custodian of the "Army Medical War Collection." Our readers may remember that very soon after the outbreak of war steps were taken to collect and preserve specimens of the wounds and diseases suffered by men on active service. The material thus collected was forwarded to the Museum of the Royal College of Surgeons, where it was dealt with by the staff of the Museum—the Council of the College having placed its staff and premises at the disposal of the Director-General of the Army Medical Services. At first it was supposed that the value of such a collection would be chiefly in its serving as a historical record of medical and surgical experience; but the work of dissecting, mounting, and cataloguing the specimens had not proceeded very far when it was perceived that the collection was of immediate and permanent value for the education of army medical officers. By the end of the war Prof. S. G. Shattock and Mr. Cecil Beadles had already mounted some 1500 specimens, and in the last four years an equal number has been added from the stores assembled during war time, so that the collection now consists of over 3000 specimens, at present exhibited in one of the larger rooms of the Museum.

The collection is the property of the Army Council; the very considerable cost involved in collecting, preserving, and mounting the specimens has been borne by the Army Medical Service Corps. The natural home for such a collection is the Army Medical College at Millbank, but at present neither the necessary accommodation nor the technical skill required for the upkeep of the collection can be provided at Millbank. Hence the present Director-General, Sir John Goodwin, who, as has been the case with his predecessors, has taken the closest interest in the upbuilding and preservation of this collection, entered into negotiations with the Council of the Royal College of Surgeons with the result that the College has undertaken the custody of the collection. Under the terms of agreement the College undertakes to provide suitable accommodation for the collection, and already, so we understand from the Conservator's report, extensive building operations are being carried out to provide the necessary accommodation in the eastern part of the present Museum. The Council of the College not only undertakes to complete, catalogue, and instal the war collection in suitable premises, but also to make it freely accessible to the professors at the Royal Army Medical College, and to all interested in military surgery. To assist the Council of the Royal College of Surgeons to carry out this scheme the Army Council has made a grant of £7500. Early in 1923 the war collection should be installed in its new home. We learn from the Conservator's report that several collections formed in connexion with special hospitals are to be added—such as that at Queen's Hospital, Sidcup, where Mr. H. D. Gillies and his colleagues have assembled a most instructive series of models to illustrate the results obtained by the application of plastic methods of surgery to restoration of injured and deformed faces.

[3] Biochemische Zeitschrift, 1921, cxxvi., 33.
[4] Med. Jour. South Africa, 1921, xvi., 109.

THE ANTI-VIVISECTION SOCIETY: AN APOLOGY.

IN the May, 1922, number of the *Animals' Defender and Zoophilist*, issued by the Anti-Vivisection Society there appeared an article, written by Mr. Stephen Coleridge, in which it was suggested that the annual Parliamentary return, made by the Home Office, of experiments on living animals performed by licensees under the Act 39 & 40 Vict. c. 77 (known under the short title of "The Cruelty to Animals Act, 1876") during 1920 represented "a deliberate *suggestio falsi*." The article proceeded with the suggestion that, with the connivance of the Home Office, certain licensees under the Act had made false returns of experiments performed by them on living animals during the year 1920. As the result of certain action taken by the solicitors representing one of the licensees referred to in Mr. Coleridge's article the following retraction of, and apology for, the untrue and libellous suggestions made therein was published in the July and August numbers of the *Animals' Defender and Zoophilist*:—

Apology to Mr. A. G. R. Foulerton, F.R.C.S.

In the issue of this journal for last May on pages 7 and 8 appeared an article entitled "Is it only innocent credulity?"

The article contained statements which have been understood as accusing Mr. Foulerton of having knowingly signed false returns in returns made by him to the Home Office (in regard to experiments made on living animals under licenses granted to him pursuant to statute) and of having committed criminal offences.

Our suggestions to that effect were made without any foundation and we are satisfied that there is absolutely no justification for any accusation of the kind.

We apologise to Mr. Foulerton for having made the statements complained of and sincerely regret the pain and annoyance that he has thereby suffered.

NORMAL MORBID ANATOMY.

ONE of the most serious obstacles to the finer development of morbid anatomy which the general progress of medical science requires is our comparative ignorance of the appearance and structure of the viscera of average healthy people. No one really knows what he would find if he brought the first 20 people he met in the street to autopsy. It is, for instance, still an open question whether the enlarged thymus and turgid lymph glands found in a healthy child after death under an anæsthetic are anything

more than signs of normality and the absence of hospitalisation. Of the condition of the kidneys in normal pregnancies only enough is known to show that there is much to be found out and explained. If general violence and murder furnish the material, they are likely to take away the possibility, if not the spirit, for its full investigation. Sudden death by accident provides the only opportunity for the ordinary morbid anatomist to familiarise himself with the normal. And in any one man's experience how little these opportunities add up to! For it seems certain that the sample of the population which is examined in this way is not a just representation of the normal state. A curious story appears in the press about a street accident in Manchester. After an extraordinary conflict of evidence as to their relative shares in the occurrence given by the drivers of two motor-cars there emerged agreement on the one point that the deceased was struck by a car and knocked down. He subsequently died, and at autopsy a cerebral tumour was found without any evidence of injury. Limited individual experience suggests that illness of one sort or another is the cause of a good proportion of street accidents. It is certainly remarkable how frequently the dead are found to be substantially diseased; a man who is shaken off his van in the Borough High-street in a collision and pulps his head is found to have massive thrombosis of the aorta, a woman knocked down by a tram in the Westminster Bridge-road to have a stomach mortally burned with some corrosive poison. And it would seem that a granular kidney or a cirrhotic liver often determines whether an overbold adventurer into the traffic of a street or a shunting yard shall be counted among the quick or the dead. Accidents therefore cannot be trusted to give us a normal sample of the population; the results must be treated with discretion. And it seems that pathologists will not easily get the information they want.

SELF-PRESCRIPTION OF DANGEROUS DRUGS.

FORMAL notice has been given by the Home Office of certain amendments designed to strengthen the Dangerous Drugs Regulations, 1921. The attention of medical practitioners should be directed in particular to one of these draft amendments by which it is proposed to add to regulation 5 of the principal regulations, made May 20th, 1921, the words: "The prescription shall not be given for the use of the prescriber himself." Regulations intended to restrict, if they cannot prevent, the sale of drugs for "doping" purposes are likely at times to interfere to some extent with the freedom of persons who wish to purchase drugs for lawful medicinal purposes. It is, however, only just that such interference should be as slight as possible and exercised only where its advantages at least balance its disadvantages. There can be no advantage derivable from forbidding all medical practitioners to prescribe certain drugs of not uncommon use for their own treatment, unless the veto will place a substantial obstacle in the way of the insignificant minority among them who are addicted to the improper use of these drugs. The proposed regulation can hardly effect this. Doctors in practice who dispense their own prescriptions, and even those who do not, cannot be prevented from having the drugs in question in their possession, and the drug-addict, not being usually a person of sensitive conscience, will not be diverted from his purpose by the fact that the prescription which he signs must not contain his own name as patient. On the other hand, although a practitioner in a populous district on friendly terms with his colleagues might have no difficulty in obtaining, even when in a hurry for it, the required document, there are many country doctors who would have no such facilities. The proposed amending regulation would appear, therefore, to cast a slur upon the medical profession in general, and to promise considerable inconvenience to many of its members, without being likely to achieve in any substantial degree the end which its framers have in view.

PSYCHO-ANALYTICAL SCHOOLS OLD AND NEW.

BY J. ERNEST NICOLE, L.M.S.S.A. LOND.,
ASSISTANT MEDICAL OFFICER, LANCASHIRE COUNTY ASYLUM, PRESTWICH.

(*Concluded from p. 352.*)

As was said in the previous section of this article, C. G. Jung, a disciple of Freud, developed "the association method," the main exponents of his view being, among others, J. Allcock, M. K. Bradby, C. Long, M. Nicoll, and to some extent H. Silberer.

Kempf.

E. J. Kempf attacks the problem of the psychology of the emotions from quite a different angle. He admits the value of the work of Freud and Jung in giving a psychological description of the emotional conflicts, but deplores the want of correlation between the psychological and the physiological. Working on the same lines as C. S. Sherrington, he first establishes the essential function of the autonomic nervous system in the production of emotion. He regards the human organism as a biological machine which assimilates, transforms, and expands energy, these operations being regulated by the autonomic system and the projicient sensorimotor apparatus, the former controlling the latter. The James-Lange theory states that an emotion is the feeling of bodily changes following the perception of a stimulus, Kempf claims that if we experience an emotion it is because some segments of the autonomic system have assumed a certain tension, and that the resulting disturbance is the emotion. This resulting disturbance, he says, is in the nature of a distinct attempt at readjustment, a "craving" for finding those conditions which will relieve the tension in these autonomic segments. This autonomic attempt or "craving" is the physiological conception of Freud's psychic "wish," and Kempf states his theory thus: "Whenever any segment of the autonomic-affective apparatus is forced into a state of hypertension through the necessities of metabolism or exogenous or endogenous stimuli, the hypertense segment gives off a stream of emotion or affecting craving which compels the projicient apparatus to so adjust the exteroceptors in the environment as to acquire stimuli which have the capacity to produce comfortable postural readjustments in those autonomic segments." The influence of social conditions and of education on our primitive affective cravings causes some of these to become so unjustifiable, and also ungratifiable, as to be associated with fear, and as a result compensatory strivings grow up in order to prevent the manifestation and recognition of these "fearful" cravings. Under the influence of fatigue, however, or of toxic conditions, of excessive external stimulation, &c., the control mechanism breaks down and pathological expression of the primitive cravings occurs. He considers all mental derangements in the light of his autonomic theory, calls them all neuroses, and classifies them ætiologically as follows:—

(*a*) *Suppression neurosis*, where there is clear to vague consciousness of the nature and effect of the ungratifiable affective craving, with symptoms easily traceable to it.

(*b*) *Repression neurosis*, where there is vague consciousness to total unconsciousness of the nature and influence of the ungratifiable affective craving, with symptoms that are direct results of this craving but not easily traceable to it.

(*c*) *Compensation neurosis*, where the persistent strivings to develop potent functions and win social esteem initiated by fear of impotence or loss of control of asocial cravings are comparable to Adler's "psychical compensation."

(*d*) *Regression neurosis*, where there is failure to compensate but regression to a preceding more comfortable irresponsible level permitting of wish-fulfilment fancies, postures, and indulgences.

(*e*) *Dissociation neurosis*, where the uncontrollable cravings dominate the personality despite all efforts to prevent it.

These cravings, of course, Kempf does not consider to be merely sexual, as Freud does: he believes them

to be numerous and varied, such as love, hate, jealousy, sorrow, struggle for goodness, and for virility, &c. As regards treatment, he agrees mostly with Jung and emphasises the importance of conscious readjustment, though without subscribing to Jung's view of the irrational but ethical function of the unconscious.

Social Psychology.

Before proceeding any further with psycho-analysis, we have to trace some foreign influence coming from schools of thought which are not psycho-analytical but have an important bearing upon the subject. Social psychology is such a school: coming down from Malebranche, it has several modern exponents.

As regards psycho-analysis, W. McDougall admits the theory of repression and of sublimation, and their influence upon the development of art as an unconscious symbolism. He first disagrees with Freud in distinguishing love from sex and would describe the love instinct as distinct and not directly connected with the propagation urge. Further, instead of describing one or two primitive instincts and tracing their manifestations into different forms which appear as secondary instincts (for instance, Freud considers the instinct for being hurt not as a separate urge, but as a component of the sex-instinct which may secondarily function alone) he describes several distinct and separate instincts such as love, hatred, curiosity, fright, &c. To him, an emotion is the affective aspect of the corresponding instinct; he thereby approaches the view of Jung, who identifies unconscious emotion with instinct. He also lays emphasis on the importance of passive suggestibility as a factor in the moulding of collective opinion into standard forms.

J. Drever agrees mostly with McDougall, but rejects more of Freud's views on pathological repressions. Some of the abnormalities of reactions which Freud would describe as symptomatic or neurotic, Drever traces not to a repression in the Freudian sense but merely to the persistence of one emotion reinforcing a subsequent and foreign motive and colouring the latter with an abnormal insistency and importance. Thus any impulse preceded by another impulse with strong emotional affect will be strengthened—or diminished as the case may be—by the persistence of that earlier affect. Drever allows, however, the unconscious influence of instincts in spite of all conscious efforts at their annihilation.

W. Trotter is prepared to accept Freud's views with certain reservations concerning their exclusively sexual nature, and draws a parallel between physical embryology and the mental embryology of Freud. He lays great stress upon the fact that Freud elaborates complicated views on the material which is subjected to repression, and yet pays little attention to those mental contents that are responsible for the repression, beyond calling them "the censor." Trotter puts forth the view that this "endopsychic censor" is nothing more or less than the "herd instinct," and therefore would see more of conflict between different instincts in the phenomenon of repression than mere psychic censoring.

The New Psychology.

What is now termed the new psychology consists of the more recent expositions of psycho-analysis, and is mainly characterised by an attempt at harmonising as much as possible the different lines of thought already described. Thus A. G. Tansley brings together both Freud and Jung, and tries to translate one into the other, but with the important addition of Trotter's herd instinct. He then proceeds to describe all mental conflicts in terms of sex, ego, and herd instincts and their reactions the one upon the other, extending psycho-analytical principles more to the explanation of general psychology than to the curing of the mentally deranged. Engaged in the same way as Tansley in broadening the general conceptions of psycho-analysis with the aim of utilising as much as possible of what is good in the different schools of thought might be mentioned R. H. Hingley, A. Tridon, S. Brierley, and C. W. Valentine.

General Psychiatry.

Apart from its application in true neuroses, psycho-analysis has found its way into the general descriptions of insanity.

B. Hart outlines the principles of psycho-analysis in a form applicable to all mental disorders, but in common with many psycho-analysts of the new school, he adopts the "multiple instincts" view as against those recognising the sex and ego urges only. Also he ascribes some of the mechanisms peculiar to Freudian repression equally well to "incomplete repressions" implying a partial consciousness of the causal factor, thereby approaching Kempf's "Suppression neurosis" and enlarging upon Freud's original views. On the side of military psychiatry, psycho analysis has made its influence felt also, though not always in agreement with Freud, who regards war-neuroses as the result of self-love or narcissism.

C. S. Read has applied the ego urge as well as the sex-instinct to the elucidation of war insanity. He relies less on a real psycho-analysis than on an intelligent interrogation of the patient with a psycho-analytical interpretation of the facts from general principles with subsequent guiding of the patient back to conscious readjustment.

M. Culpin follows Read largely, and considers the three factors concerned in the production of a neurosis to be repression of fear, a weak herd instinct, and environmental stress, and he elaborates this view along broadly psycho-analytical lines. The whole school of psycho-analytical psychiatrists are characterised by the broadness of their views combined with the superficiality of their analyses.

The Nancy School.

We find in C. Beaudouin's recent work an attempt to harmonise the French suggestion school with psycho-analysis. He believes that all suggestion is, especially in its final stages, auto-suggestion: he holds that when an end, desirable to the individual, has been suggested to him, then the unconscious immediately finds a means for its realisation, this function of the unconscious agreeing rather with Jung's teleological view. To explain this reaction of the unconscious to suggestion, Beaudouin postulates an inherent "ideo-reflex power" which would partly correspond to Jung's libido and partly also with McDougall's "primitive passive sympathy," to the abnormal functioning of which Beaudouin would ascribe the neurotic symptoms. This power would be a primitive urge—an urge with both energy and direction, both power and desire combined, the Kundalini of the Hindoo philosophies; he advocates as treatment education to auto-suggestion—that is, the cultivation and guidance of this power, a preliminary Yoga for the control of the unconscious. It might be mentioned *en passant* that some modern psychotherapeutists have taken to using hypnosis as a means of analysis, psycho-analytical principles as a guide to therapy, and suggestion in order to effect the actual cure (e.g., Eder and W. Brown).

The Biological School.

Here we have a line of investigation based not on mental ontogeny as Freud's is, but on mental phylogeny. Drever really belongs to this school, but was mentioned earlier on account of his close agreement with McDougall's social psychology.

L. Morgan, who approaches psychology from such a biological standpoint, has, however, much to say in appreciation of Freud, though disagreeing with some of his conceptions. Thus he would deny unconscious ideas or wishes as definite entities forced out of consciousness but pursuing an autonomous life of their own; all he admits in the unconscious are processes, trends, or predispositions that would, if allowed, affect consciousness in particular ways. Thus there is no such thing as an unconscious thought, but only unconscious potentiality for moulding that thought in consciousness, no buried wish but only the tendency for the conscious formulation of that wish.

W. H. Rivers begins by a comparative survey of instinct in the lower animals, and holds that instincts,

like sensations, can be grouped into protopathic and epicritic, and that as the latter develop, the former become suppressed. (He is here using "suppressed" much in the way that Freud would use the term "repressed"). The protopathic group thus contains primitive and anti-social instincts obeying the "all-or-none" principle of response, and those elements of experience connected with them which would interfere with social adaptation are thrust into the unconscious. He considers that our mental faculties are developed in levels, that each level is controlled by the one above, and that each has its own trends, its own modes of working, and its own means of expression. Partly meeting the French school, he explains neurosis as an auto-suggestion putting a higher level in abeyance with the result that a lower one is now free to express itself in its own symbolic language. Thus, though he would agree with much that is contained in Freud's theories, he denies the presence of a "censor"—ascribing its function to the controlling of one level by the other—and also denies Freud's exclusively sexual outlook, himself seeing in dreams not a distortion and symbolic concealment, but a natural and primitive functioning of an elementary level of thought.

Psycho-Analytical By-Paths.

A brief mention might now be made of the various "side-lines" which have proved favourable soil for sowing the first grains of psycho-analysis.

(*a*) *Education.*—The recognition of the factors of faulty development in childhood, such as parent fixations and their rôle in the production of neurosis, has led to the application of psycho-analysis to that other branch of medicine, prophylaxis. H. Crichton-Miller advocates strongly that all teachers should be psycho-analysed, so as to prevent their judgment of the children under their care being warped by the distorting influence of their own unconscious complexes. He inclines more to Jung than to Freud in his treatment of the subject, but lays stress on the kind of suggestibility which Beaudouin terms "acceptivity" and which is so marked in children. He traces the influence of the reaction to authority rather in the manner of Stekel, details the rôle of phantasy formation in child-life, and establishes an important difference between the emotional development of the boy and that of the girl, in that the successive attachments in a boy are: Mother—father—boys—girls; whereas in a girl they are: Mother—girls—father—boys. He discusses the great importance of the homosexual phase in the growing girl, and points out the necessity for direction of interest rather than elimination of sentiment. Finally, he considers the influence of the herd-instinct, and the means of harmonising personal interests with collective good.

The special application of the new psychology to the education of the adolescent girl has been discussed by P. Blanchard; in her book she draws widely from Adler, Jung, Bergson, Trotter, and others, and discusses the different conceptions of love, including O. Weininger's theory of male and female plasms. E. Evans treats of the problem of the nervous child, being a close follower of Jung in her discussion of the utilisation of libido. Other writers on education and children from a psycho-analytical point of view are H. Von Hug-Hellmuth, N. Niemeyer, H. A. Bruce, F. Watts, G. H. Green, and others who have already been mentioned earlier.

(*b*) *Criminology.*—There is a growing tendency to regard the criminal, especially the youthful offender, as a type of pathological individual comparable to the neurotic afflicted with impulses or obsessions. The connexion between impulsive crime and pathological repression has been well worked out by W. Healey, who shows how mental trauma—frequently of sexual origin—may be the cause of delinquency in children. He follows no definite school of psycho-analysis, but investigates each case on its own evidence.

(*c*) *Primitive Sociology.*—The psycho-analytic study of taboo and primitive customs was first undertaken by Freud, but more and more is this work being carried on by psycho-analysts with outlooks broader than that of Freud. The names of M. Knight, I. L. Peters, S. Brown, and others are associated with the psycho-analytical consideration of Taboo and Genetics, drawing largely from J. G. Frazer's works, and explaining the facts in the light of modern knowledge. Much work on the subject is also to be found scattered all through the psycho-analytical writings of previously mentioned authors.

(*d*) *Modern Sociology.*—The problem of psycho-analytical interpretation of sociology has been undertaken by E. R. Groves, Moore, and others. A. Kolnai, a partial follower of Durkheim, traces socialistic thought to the influence of the father, and broadly ascribes anarchism to a revolt against the father. Pure communism he considers as a partial regression to the mother with a temporary suspension of the father, or authority principle, but with its subsequent re-establishment, as when the abolition of an aristocratic class is followed by the creation of a new ruling class chosen from among the people. Anarchist communism, however, goes farther and leads to a permanent abolition of all laws without replacement of them by critical judgment. Yet although it is not so practicable as a system, it is psychologically more satisfying and will be extensively followed, because the original trend of the œdipus complex is more fully expressed: emancipation from the father and reunion with the mother, such reunion involving the principle of common origin—i.e., universal brotherhood, as also the resumption of the infantile level repudiating all personal autonomy. On the other hand, anarchist individualism is less satisfying because instead of overthrowing personal responsibility it enhances it; it proclaims not the bondage of brotherhood, but the freedom of Bolshevism. It only follows the œdipus trend as far as the overthrowing of the father and does not include the regression to the lower levels of irresponsibility. Kolnai further elucidates secondary social reactions, and amongst other topics discusses Marxism as a partial regression, a paranoidal form of expression standing to anarchism in much the same way as paronoia does to paraphrenia.

(*e*) *Interpretation of Faiths.*—The interpretation, psycho-analytically, of the beliefs, symbolisms, and characters found in religions has recently been extensively followed. The symbolisms have been taken up and analysed by Freud and others in conjunction with the interpretation of myths, parables, and folk-lore. As regards the forms of religion, Jung believes that faiths are symbolic expressions of what is in the collective unconscious, just as dreams are the outcome of the contents of the personal unconscious. The unconscious conception—or better thought-feeling—of power, conservation of energy, absolute good, creation, &c., have all been externalised, personified, and symbolised into gods, infinite beings, divine goodness, the devil, stories of creation, &c. But recently more attention has been paid to interpretating the characters found in creeds. Thus, G. Berguer has given us a good study (psycho-analytical) of Christ, while W. S. Swisher discusses the problem of neurosis in religious writers: he holds that modern Christianity is not the religion of Jesus, but the teachings of Paul—Paul, who had a heavy anxiety hysteria, and converted Jesus' teaching of love expression into the repression of a new Pharisaic mode of life. Paul's neurotic traits included sadism, but after his anxiety attack with hallucinations on the road to Damascus, he went to the other extreme and—by the law of ambivalency—inflicted upon himself what he used to wish to others, thus becoming a masochist. The author further shows that even to-day the Roman church exhibits these morbid symptoms that characterised Paul the neurotic.

(*f*) *Ethics.*—As we have already seen when considering Jung, psycho-analysis could not fail to have an important bearing on ethics; the first to seek a moral guide in the Freudian doctrine was J. J. Putnam, who was followed later by J. T. McCurdy.

Latterly the further application of the unconscious "wish" to ethics has been pursued by E. B. Holt, who considers the "wish" rather in the light of Kempf's "craving," and sees its origin in reflex act, in the primitive conative tendency of the individual. The cause of an action, he says in common with R. Briffault, is not its "purpose" or "end," but the desire to perform it. Thought he considers but as latent course of action, and he maintains that ethics must be based on facts and our appreciation of them —i.e., discrimination. In any moral dilemma we should not repress either alternative in favour of the other, or else comply now with one and then with the other in order to compromise, but we should discriminate between the two in such a way as to choose a line of conduct expressing as harmoniously, and as much of, the conflicting trends as possible. To him, as to Socrates, virtue is but a form of wisdom. This idea of harmonising our instinctive trends in order never to let one go entirely unexpressed has been carried far into the special realm of sexual ethics, and applied there by W. F. Robie, W. J. Fielding, and others.

(*g*) *Philosophy.*—That psycho-analysis received valuable support from the Eastern philosophies is well-known, and a glance at, for instance, the Mahabharata will be sufficiently convincing; but in Western philosophy it is beginning to make its effect actively felt. Thus some philosophers, such as B. Russell, invoke its aid in proving that mere consciousness as a fundamental datum is to be rejected, and range themselves very close to Jung, when they maintain that wishes may for ever be unconscious and never reach the threshold of consciousness. Psycho-analysis, too, by tracing in the unconscious an inevitable and preformed origin for so many conscious acts, is directly opposed to the "free-will" doctrine. This might indirectly lead to an important revision of our conception of reason; so much of our apparently faultless reason is but the "rationalisation" of unconscious trends that we might well be led to ask, "Is not all our reason but 'rationalisation'?" Would it not appear that reason as a "pure" principle is a myth? Just as the paranoiac reasons well on premises that are shown to be false by the majority who are not paranoiacs, so might we all be reasoning on data about which all we can say is that there has so far been no majority to prove them untrustworthy. Further, the dynamic conception of unconscious motivation deals rather a blow to the upholders of the belief in an independant and causal "spiritual" factor. That psycho-analysis affects many minor philosophical issues is evident, but these cannot be treated of here.

(*h*) *Interpretation of Literature and Art.*—The relation between art and the unconscious has been incidentally touched upon by many writers, some being more detailed than others; for instance, A. Evarts has written well on the subject of colour symbolism. In literature the erotic motive has been studied by A. Mordell, who analyses the writings of many classics; other authors, too, have partially analysed the works of Heine, Schiller, Blake, &c., and have published good analyses of such well-known characters as Hamlet, Faust, Lohengrin, and others. L. Dooley writes well on the psycho-analytical interpretation of genius, and such writers as G. S. Viereck have investigated and analysed the lives of public men (e.g., Roosevelt as a case of ambivalency). The interpretation of the drama has mainly been carried out by S. E. Jelliffe.

(*i*) *Psycho-Analytical Fiction.*—Apart from the support yielded to psycho-analysis by the older classics, a class of writers has sprung up who, if not writing with actual psycho-analytical knowledge, at least are capable of portraying faithfully well-known psycho-analytical types. Just as examples we might quote C. Dane's description of the "will-to-power" type in "A Regiment of Women," and D. H. Lawrence's treatment of both the ego and sex characters in "Women in Love," a masterly study of human behaviour and mental undercurrents.

Conclusion.

We see, then, how "psycho-analysis" of to-day is not merely one doctrine, but consists of many schools and many points of view, and therefore, also, of many conflicting conclusions. Yet the bitterness of the strife raging between faction and faction is waning, and one welcomes the new trend, showing itself particularly in the works of the educationist section, which aims at harmonising and utilising the different views rather than contradicting and belittling them.

In conclusion, I wish to point out that if any author's view appears to have been misrepresented or not adequately noticed, it is because of the desire to attain as much conciseness as was consistent with reasonable accuracy.

THE ANNUAL REPORT OF THE REGISTRAR-GENERAL.

THE eighty-third annual report of the Registrar-General for England and Wales (1920) now to hand is priced at 20*s.* instead of the much larger sum charged for the corresponding Scottish report recently issued. The above price is too high to render it likely that a copy of the report will be acquired by every sanitary authority, which is essential in the public interest, but we may be thankful that in the see-saw of unwise economy the strangle-hold of false economy has been mitigated in this instance.

The report is of great medical and public health value. The study of the entire preliminary part of the report (110 pages) should form part of the duty of every medical officer of health; and the contents of the present report equal in value the corresponding parts of previous reports, which we have learned to associate with the name of Dr. T. H. C. Stevenson.

Births and Infant and Child Mortality.

Births.—The number of births was greater than that recorded in any year in the history of the country, the nearest approach being in 1903, when the birth-rate, however, was 28·5 as against 25·5 in 1920. The sex ratio remains much above the pre-war level.

Infant Mortality.—A valuable table on pp. xxviii.–xxix. gives the rate of infant mortality for each of the first four weeks of life and for each of the subsequent months of the first year of life for each quarter of every year from 1911 onwards; and a similar table is given for diarrhœal diseases separately.

Temperature and Infant Mortality.—There is a well-marked correspondence between infant mortality and temperature, and this correspondence exists so early as the first week after birth. It may be inferred, therefore, that the mortality of the remainder of the first week after the first day is much influenced by environment, and should be susceptible of improvement by increased post-natal care. It is satisfactory to find, in accordance with this view, that the set-back in the death-rate for the first four weeks after birth which occurred in 1919 has been more than redeemed, the death-rate for this period of life in 1920 being the lowest on record. Among the other important details on infant mortality given in the report may be named such striking contrasts as the following. In East Ham the infant death-rate was only 65 per cent. of the average for county boroughs, while in Middlesbrough it was 148 per cent. of this average. The differences were quite as striking for the death-rate under four weeks, showing the wide range of preventability of infant mortality at this early age. Thus, in Southampton the death-rate was 63 per cent. and in Barnsley 147 per cent. of the average for all county boroughs.

Among the causes of infant mortality the largest declines were shown in developmental conditions. The mortality from syphilis, which rapidly increased with the war to a maximum in 1917, has declined since that year continuously, though it has not yet

regained its pre-war level. Rickets, again, shows a rapid decline. Infant mortality from tuberculosis has declined so rapidly and continuously that "this disease is ceasing to be an important contributor to the death-rate." A decline of infant mortality from all tuberculous diseases from 4·92 per 1000 births in 1906 to 1·47 in 1920 appears to suggest alteration in death certification as well as reduction of human sources of infection.

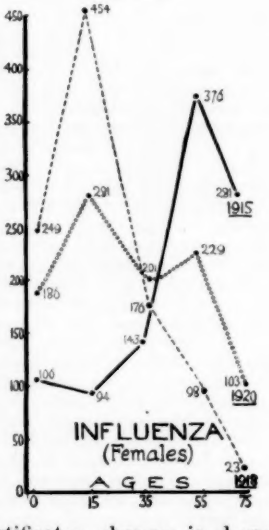
Mortality at Ages 1–5.—For some years past the Registrar-General's annual report has comprised valuable data for the study of child mortality at each year of life from 1 to 5; and for 1920 tables on p. lvii. enable a comparison to be made of the death-rate in each month of life from the 13th to the 24th inclusive, as well as for each of the second and the three following years of life. This comparison is possible for several sections of the county, as well as for town and country.

Maleficent Influence of Town Life on Childhood.—This injurious influence is scarcely visible in the first four weeks after birth, the ratio of urban to rural mortality being 102 to 100; in the next two months it is as 134 to 100 at ages 3–6 months as 151 to 100, and in the two following trimestral periods as 153 and 164 to 100. At 12–15 months in urban areas it is as 182, at 15–18 months as 195, at 18–21 months as 175, and at 21–24 months as 170 is to 100 in rural areas. The evil effect of urban life is much greater in the second than in the first half of infancy, and greater in the second year than in infancy.

Influenza.

Age-Incidence.—From the interesting figures on age-incidence of influenza given on p. lxviii. we have constructed a diagram of death-rates (female) of influenza at different ages. (Diagram I.)

DIAGRAM I.



The puzzle, the explanation of which is still to seek as to the altered age-incidence of the chief mortality from influenza, is shown in this figure. The age-curve for 1915 may be regarded as characteristic of influenza for all years prior to the great epidemic of 1918, the higher death-rate at ages over 35 being the outstanding feature. In 1918 this condition was inverted; and in 1920, although the difference in mortality of young and old is less marked, a heavy incidence on younger ages continues. Truly an epidemiological puzzle.

Syphilis.

Although the deaths from syphilis will probably always be greatly understated in death certificates, changes in degree of completeness of registration are slow in operation, and therefore figures for successive years may be comparable. Furthermore, in view of our knowledge of the common or universal syphilitic causation of tabes dorsalis, general paresis of the insane, and aneurysm, the range of comparison is extended. Comparing death-rates per million in 1915 and 1920 respectively, we find that in the former year syphilis was the registered cause of 53, and in the latter year of 54 deaths, tabes dorsalis of 21 and 16 deaths, general paralysis of 62 and 40 deaths, and aneurysm of 31 and 26 deaths. All these except syphilis itself show a decline; and as pointed out in the report, the exception is only apparent; for inasmuch as over two-thirds of the deaths ascribed to syphilis occur in infancy, the higher birth-rate in 1920 meant that stated in terms of infantile population the death-rate from syphilis in that year was lower than in 1915. A long interval occurs between syphilitic infection and death from consequent tabes, paresis, or aneurysm; nevertheless, the figures suggest that already measures, educational and curative, taken in recent years are having their effect. The figures for the next five years will be even more interesting.

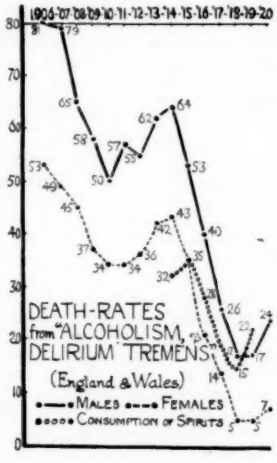
Cancer.

The association of cancer mortality with senescence is one of its most characteristic features; the age at which cancer increases is gradually becoming higher. Thus cancer as returned is certainly now more a disease of old age than it was formerly, although in the report it is cautiously suggested that this change may in part be the result of improvement in diagnosis. During the last six years no further increase in the national death-rate from cancer appears to have occurred. The localisation of cancer has important sex differences. The female mortality from cancer of the alimentary canal above the stomach is a small fraction only of that of males, but females suffer more than males from intestinal cancer. The excess of cancer mortality in the female sex is dependent upon disease of the breast and generative organs. The most remarkable contrasts in the two sexes are death-rates per million of 63 and 6 for tongue cancer, and of 73 and 22 for œsophageal cancer. It is scarcely possible to avoid speculation as to the conceivable local irritating effects of tobacco and of undiluted spirits in producing this result.

Alcoholism.

The student desiring to ascertain the number of deaths attributable to alcoholism will need to remember the altered practice in classification since the international system was adopted in 1911. This system excludes organic disease attributed to alcoholism, the effect being to reduce the number of deaths in 1920 from 577 under the old system to 216 under the new. In Diagram II. is shown the course of the death-rate per million living from "alcoholism, delirium tremens" (old system) from 1906 onwards.

DIAGRAM II.



As remarked in the Registrar-General's report, it seems impossible to avoid connecting this remarkable movement of the death-rate since 1914 with the institution of restriction upon the sale of alcohol during the war, followed since the war by relaxation, and an upward trend in the curves, probably already less marked than it would have been had it not been for industrial depression. The preceding diagram shows the close parallelism between the millions of proof gallons of spirits retained for consumption in the United Kingdom in each year, 1914–17, and the alcoholic death-rates. The curve of beer consumption runs similarly.

The Puerperal State.

The cause of mortality from septic and other complications of childbirth is far from satisfactory. Under both of these headings towards the end of last century the mortality ascribed to childbirth was rapidly declining. This decline was much less in the succeeding years, and it has been succeeded by a

slight rise in recent years, which has become considerable in the last two years. Evidently much work in preventive medicine and great improvement in our midwifery services are called for before the national position in this respect can be described as satisfactory.

Ill-Defined Causes of Death.

The pages of the annual report dealing with this subject should be in the hands of every medical practitioner. Posterior basic meningitis, instead of being limited to a type of sporadic meningococcal infection has often been used as if this term had only an anatomical significance. Similarly with cerebro-spinal meningitis, which has not been limited in use to cases of cerebro-spinal fever. "General paralysis" is most often used as a contraction for general paralysis of the insane, but some practitioners apply the term to any paralysis of widespread or general nature. The term "fibroid phthisis" again is used sometimes to imply non-tuberculous fibroid disease of the lung. Inquiries from Somerset House in respect of this condition are found to elicit remonstrances based on the ground sometimes that fibroid phthisis always, and sometimes that it never implies tubercle.

Deaths in Institutions for the Sick.

The increasing amount of hospital treatment of the sick is reflected in the statistics of death. In the country as a whole in 1911–13, on an average 20·9 per cent. of the total deaths occurred in institutions. In 1916 and 1917 this proportion had increased to 24·4 and 26·3 per cent. respectively. In 1920 the proportion was 24·4 per cent., 11·7 per cent. of the total deaths occurring in Poor-law institutions, 2·0 per cent. in lunatic and idiot asylums, and 10·7 per cent. in hospitals.

In the above paragraphs only a few points of general interest have been dealt with. The entire report deserves study. It is a worthy record of the most accurate and complete vital statistics extant; and we trust it may long continue to maintain its present high standard of medical and hygienic importance.

THE SALE OF FRUIT.

ATTENTION has been recently called to various difficulties in connexion with the inspection of unsound food, especially fruit, and the need for modification of the present law dealing with the subject has been urged. Views have been expressed that, owing to the wholesaler being allowed to sell packages containing a considerable proportion of unsound fruit without sorting, an undue amount of work is thrown on the health departments of the localities where the fruit is sold retail chiefly by street-traders.

Legal Position of the Wholesaler.

The legal position of the wholesaler is more or less firmly established by the case of The Queen *v.* Dennis (1894, 2 Q.B. p. 456).

The defendant was summoned by an inspector of the Bermondsey borough council for selling to a man named Lyons certain walnuts which were unwholesome and unfit for the food of man; the proceedings were taken under Section 47 of the Public Health (London) Act, 1891, Sub-section 3. The defendant claimed his right to be tried before a jury, and was therefore tried at the London Quarter Sessions.

A consignment of 83 bags of Grenoble walnuts was received by the defendant at his warehouse for sale on behalf of the foreign owner. One bag was taken indiscriminately from the bulk as a sample and found to contain sound walnuts. Ten bags were sold to a customer other than Lyons, and afterwards, on the same day, Lyons bought 20 bags of the walnuts, after examining the sample bag, but without examining the bulk. This was on a Saturday. After taking them away, Lyons examined them and found the major portion of the walnuts were bad, and on the following Monday he handed the walnuts to a sanitary inspector for Bermondsey.

After the sale to Lyons on the Saturday, the first customer returned eight of the 10 bags sold to him as unsound. On the Monday the defendant heard for the first time of the bad quality of the nuts and ordered the bulk to be examined, and as the result of the examination the eight returned bags and about 15 more were by his orders destroyed. What then remained of the bulk were sold to a person who promised to sort them and destroy the bad ones. Over the pigeon-hole of the pay desk in defendant's shop there was exhibited a printed and signed notice headed, "Special Notice to Buyers. Original packages of either fruit or vegetables, the contents of which may partly prove unsound, either from delay in transit or any other cause, are sold on the express condition that the buyers sort the said contents, and destroy the unsound portion before being offered to the public."

At the hearing of the case at Quarter Sessions, the defendant admitted that he knew most of the bags in the consignment would in all probability contain some walnuts which were bad and sold them with that knowledge, but he would not have sold them if he had known they were so bad as they turned out to be. The learned chairman told the jury that the defendant could not contract himself out of the liability to a penalty by agreeing with Lyons to sort out the bad nuts, and that they must altogether disregard the printed notice. The jury found against the defendant, at whose request the chairman stated a case for the opinion of the High Court, from whom there could be no appeal, as it was a criminal matter. The case was first argued before five judges, but as there could be no appeal, and the point was an important one, it was re-argued before a full court, consisting of 11 judges, who, unfortunately, differed widely in their opinions. The majority held that at any rate the effect of the notice ought to have been left to the jury to consider and therefore the conviction was quashed. Two of the learned judges held that the notice did not relieve the defendant of the duty of seeing that the walnuts he sold were sound.

Although the general opinion in the trade and among sanitary authorities is that the case of The Queen *v.* Dennis decided that the wholesalers are necessarily protected by such a notice as was exhibited, that decision only found that the notice ought to have been left to the jury together with the other facts. At the same time, several of the judges were of opinion that the notice was a protection to the wholesaler and that the only article sold for the food of man was the sound walnuts. The decision in this case would therefore undoubtedly be a serious obstacle to a successful prosecution of a wholesaler who had exhibited such notice.

Costermongers.

It has been the custom for a considerable number of years for health departments to issue certificates where, under the provisions of Section 47 of the Public Health London Act, retailers bring to the health department unsound food for surrender, with a view to assisting them in obtaining compensation from the wholesale dealers. Costermongers are not slow to seek the aid of public health departments with a view to obtaining the refund of money on the ground that the goods bought have not turned out according to samples shown. The costermongers are in and out of the market all day on the look-out for bargains; they often work together. One man will buy from a salesman fairly large quantities—all that is doubtful of a consignment, anything from a single package up to ten or so—and share the goods with two or three others. A package is usually opened and the costers can form an idea of the amount fit for sale, but when several packages are bought it is not unusual for one only to be seen, the others being brought out after the sale from another part of the warehouse by the porters. When there is a glut of any article any coster is able to buy "good stuff." There are several types of costermongers, varying from the well-established street-trader who has a pitch which he has occupied for years, to the peripatetic hawker who has hired a barrow and sells fruit one day in one market and fish the next day in another market. Many of the best type of street-trader only buy "good stuff."

When a coster who thinks he has not been fairly done by complains at the public health department he is usually told to take the goods over to the Council's depôt and sort out the sound from the unsound. The more satisfactory arrangement is for

the unsound articles to be weighed and a certificate issued by the sanitary inspector giving the weight of the unsound food, instead of a certificate stating that so many bundles have been destroyed, from some if not all of which the sound fruit may have been picked out and sold. It is by no means unknown for the costermonger to try to steal a march on the inspector—who has left him for a time to sort out the goods—by submitting at the finish a number of boxes of alleged unsound fruit, and it is necessary to make sure that the cases are not filled up chiefly with packing, with some fruit distributed in it.

The salesman is not always convinced that the articles complained of were bought from him; he may suspect that a man after buying barrels of apples from him has put into the barrels unsound apples bought elsewhere and duly made a successful complaint to the sanitary inspector. On taking the certificate to the salesman the coster is sometimes refunded the whole of his loss; at others the salesman considers the other party should share in the loss. Occasionally he will not refund any money. County court proceedings to make him do so are not by any means always successful; although the circumstances under which the articles were sold are identical, decisions given in different county courts vary.

The compulsory sorting of damaged fruit by the wholesaler has been advocated. It is contended that the temptation is almost irresistible to a coster in poor circumstances, who has bought fruit or other food which he had found to be unsound, to sell the "goods" in order to recoup himself the money he has spent; it is urged that he would offer to sell them at a low price, when the temptation to poor people, and especially to children, to buy them cheaply would be irresistible. Children, it is held, are especially tempted to buy this unsound cheap fruit; they cannot be expected to know if the fruit is good or not, and they have finished eating it before their parents have an opportunity of preventing them.

The present system—it is thought—entails much careful supervision and extra work for the local sanitary inspector and allows a considerable risk of leakage of unsound fruit. An instance given is of a costermonger who was detected in Islington through an inspector's attention being directed to some unsound fruit in a house being visited in the ordinary course of the sanitary inspector's duties. From the description given the particular barrow was with some considerable difficulty traced and the person in charge alleged that he was only temporarily in charge, and did not know the proper owner's name. The proper owner eventually turned out to be his own brother.

It is represented that the tracing of unsound fruit and the taking of proceedings against the particular class who deal in the cheap packages disposed of by the wholesaler involves much detective inspection; while, owing to the false statements made, much time must be spent by the inspector in inquiry and verification, the end-result being frequently a very inadequate fine.

Trade Arrangements.

In order to determine the merits of the case it is necessary to know the conditions under which the fruit and vegetable trade is carried on.

The difficulty referred to above is almost invariably in connexion with imported fruit. Much of the wet fruit (currants, raspberries, plums, apricots, peaches, cherries) is imported from Holland or from France. The fruit from France usually comes from Boulogne; occasionally from Havre. To Boulogne the fruit is despatched from other parts of France or from Italy, or from Spain by rail; the checker examines the condition of the fruit; if not suitable for shipping the sender is advised to hold it and sell it at the port. On account of the distance travelled, fruit from Italy especially is from time to time so sold in Boulogne. Most of the fruit comes over as deck cargo; on short journeys very little is spoilt by the sea-water even in rough weather. Occasionally in stormy weather the ships are delayed in putting out to sea, and the delay causes the fruit to become overripe. On longer sea journeys rough weather is more serious; tomatoes and bananas coming from the Canary Islands, for instance, are not infrequently damaged in transit by sea-water. Fruit in the ends of packages placed next the boiler suffers. The usual experience of a wharf is that two or three ship-loads during the year, for one reason or another, arrive in a seriously damaged condition—i.e., about 1 per cent. of the cargoes landed during the year.

Soft fruit such as currants, cannot be brought from Italy: such fruit, even when sent from France, if picked damp, becomes mouldy in course of transit, but in point of fact only a small proportion of such articles become damaged for this reason. Spanish water-plums are very apt to become bruised and uneatable during transit. Attempts to diminish the bulk of stalked fruit are rarely successful; the close contact of red currants and bilberries stripped of their stalks frequently results in disaster. Apples from Australia and New Zealand are cooled during transit; if the temperature is allowed to fall too low the fruit goes bad. The quantity of fruit imported from abroad depends very largely on the price of the home-grown article. News of any shortage, actual or probable, of home-grown fruit is telegraphed by agents stationed in England to firms abroad, and the foreign article is at once despatched to its profitable market.

Very little of the home-grown fruit is received at the market in an unsound condition; the increased price obtained for food has resulted in more care being exercised. Most home-grown fruit and vegetables are now brought to the market by open motor vans in smaller packages than formerly, the journey only taking a few hours. Railway transit involves close packing of large quantities in closed trucks and a long journey: all of which tend to cause the articles to deteriorate, especially if there be delay in transit.

The trade arrangements are very varied. Large growers abroad have agents in England, or English wholesale firms may have branches abroad; one large English firm has a growing ground in Australia. The produce of small growers abroad is usually collected by local exporters. The wharfinger is only concerned with the storage of the goods until inspection and despatch at the broker's order; he has no interest in preventing the seizure of unsound articles. The number of packages arriving is so great and the size of the inspecting staff so small that it is fortunate that the wharfinger and his staff are always found to be willing to render the food inspectors every help. Large wholesale firms keep a representative at the wharf.

The goods are brought into the warehouse and those belonging to a particular firm piled together. The representative of the firm puts the different grade marks on the packages practically always from external inspection. He evidently goes on the condition of the packages and what he can see or feel through the spaces in the sides of the boxes. Only very occasionally are packages opened; if very "wasty" a large proportion are opened in order to see if the food inspector shall be asked to condemn them. The "show" cases are chosen haphazard; the time available for the grading of large numbers of packages does not allow deliberate selection of an unfair sample; the box taken as the sample is usually the package nearest at hand. At times the firm's representative is not the person who indicates the show cases, but a carman sent down to the wharf with instructions to bring along two boxes; he will take the box nearest at hand. The sample packages are "on show" at the showrooms; the box is opened, the contents gone through, and the bad fruit in the package put out.

In the sale catalogue at the Pudding-lane (City) salesrooms, the grade of the goods for sale is clearly set out in columns under five headings, L. (first quality), LL. (second quality), xL. (short cross), xL. (middle cross), XL. (long cross). Even if a sample favourable to the seller were shown, the grading of the packages affords the buyer a safeguard. Sale catalogues are not commonly prepared at fruit and vegetable auctions elsewhere.

Sorting.

Practically every package of fruit contains at least a small proportion of unsound fruit; it is, however, when the unsound fruit comprises a considerable proportion of the contents of the package that its presence is of serious import. To clear the ground

it should be mentioned that fruit can be purchased already sorted. In the Pudding-lane area, for instance, there are seven or eight firms of brokers who buy by auction fruit not necessarily or usually in especially unsound packages: the fruit is taken to their warehouses and the contents of the original packages sorted, the sound fruit being repacked in other packages.

The impression obtained from a visit to the premises of such firms is that only a small proportion of the fruit sold at auction in this area is so dealt with; there are no very large premises with hundreds of girls at work rapidly picking out the good fruit from the bad; all there is to be seen is a man standing by a box in a warehouse piled up with other opened boxes, gently casting out bad specimens from the package. One firm employed five or six men at this work. Although there is no doubt as to what happens to the unsound fruit, it would be interesting to follow the career of the "specked" articles. The wholesaler contends, apparently with reason, that it would be quite impossible for him to arrange for sorting; he has no room in his warehouse, which is already filled with boxes of fruit, &c., to be disposed of; for such sorting to be carried out generally the markets would require to be five or six times as large as they are at present. At times—e.g., when the whole of a ship's cargo is seriously affected—the quantity of fruit that would require sorting would be such that it could not be sorted in a reasonable time. While a portion was being sorted the rest would go bad: it is only by rapidly disposing of it to many buyers that the good fruit can be rescued from the bad before it in turn is affected. A minor difficulty is that it would be contrary to the custom of the trade for the ordinary salesman to engage a staff to sort fruit—the only men he employs are porters, who, in addition to a small weekly retainer, are paid fixed sums for each package they carry from the saleman's shop out of the market to the customer's cart.

The coster to-day serves more than one useful purpose; he helps the salesman, who wants to get his scanty space cleared, out of a difficulty—the unsound package is taking up valuable room. If the sanitary inspector were to condemn it much food perfectly good to eat would be wasted. If all fruit were required to be sorted before sale the price would undoubtedly go up to include the cost of sorting; the opportunities of the coster to buy cheap fruit would be limited to those times when there is a glut of fruit on the markets. Undoubtedly, under the present arrangement, the coster is able to sell to the poorer members of the community fruit for which they could not pay the price asked for in the shops; the public are often able to buy retail at a price less than the shopkeeper has to pay wholesale. Costers have opportunities for sorting fruit but all the arrangements made to this end are very casual, the selection of the place and sorter depends largely upon chance and vary from day to day. The sorting is more often than not carried out by the coster's mate, a friend who is picked up for a few hours' work to give a hand with the barrow or is paid something for a particular job; unless the coster's wife helps to manage the stall, she or the children rarely take part in this task. Occasionally the sorting is done in the coster's home or backyard, but any place is used for sorting, even vacant building sites and streets, especially cul-de-sacs, when the litter left after sorting not infrequently constitutes a nuisance. The nearest approach to a regular arrangement is when the sorting is carried out near the coster's home, in the yard of a more or less disused and dilapidated stable owned by one of his more successful brethren where the barrow or stall or pony and cart are kept, and his stock is stored on the rare occasions he has any left over; not a large proportion of costers have a regular arrangement of this nature.

No one can contend that these arrangements are entirely satisfactory; a feasible proposal would be that in any new market a shed should be erected for the purpose to allow of costers sorting fruit under the supervision of the sanitary inspector; it is doubtful whether in existing markets any buildings or space to erect a building are available. A suggestion capable of more ready adoption is that notice should be given to the local authority by the purchaser of fruit to be sorted and of the address where the sorting is to take place.

Wholesaler's Goods not Seizable.

A somewhat different problem is presented by a decision in a case brought by the Battersea Borough Council in 1907 against a wholesaler:—

A large quantity of unsound fruit was seized on the premises of a fruit dealer named George Walker at 351, York-road. The defence relied on a notice that was produced in court, to the effect that "original packages of fruit were sold only subject to the understanding that the fruit was to be sorted." It was admitted by the defendant that on the day, and for some days prior to the seizure, the notice had been removed from its usual position and had got concealed behind some barrels, and that fruit other than "in original packages" was sometimes sold. The magistrate held, however, that the fruit was not deposited for sale or exposed for purposes of sale, and that with regard to the absence of the notice on the days when it was not visible, that it would be necessary for the prosecution to prove that the fruit was sold on those days without the purchaser's attention being drawn to the terms of the notice. Further, with regard to the defendant's admission that he sometimes sold goods without sorting, evidence was given that his customers were old customers who were aware of the conditions on which the goods were sold, and he accordingly dismissed the summons without costs.

Fortunately the wholesalers are almost invariably willing to surrender any article considered unsound by sanitary inspectors, but the decision in this case, until upset, prevents such articles being seized if they are in an inland warehouse. The position is unique; if the articles were on a ship or elsewhere within the district of a port sanitary authority or a sanitary authority whose district includes or abuts in any part of a Customs port they could be seized under the Public Health (First Series: Unsound Food) Regulations 1908, but in an inland warehouse they are immune from seizure.

It must be admitted that the notices are of a very sweeping character. From a board on the front of the rostrum of an auctioneer the following conditions of sale were copied.

"No allowance will be made for errors of any description. If any of the contents of any package are spoilt, damaged, unsound, or otherwise defective, so as to be unfit for human consumption, such defective goods are not intended by me or purchased by the buyers FOR THE FOOD OF MAN; and the buyers shall separate such defective goods from the bulk and shall not use or sell any such defective goods for the FOOD OF MAN."

The London Fruit, Flower and Vegetable Markets Association, Ltd., to which most salesmen in the London markets belong, issue a poster to be placarded in the salesroom of their members which contains the following clauses:—

"All goods sold at this warehouse are open to inspection by intending purchasers. Sales are not made by sample, and after delivery is taken the return of goods will not be allowed or accepted, neither will any allowance be made to the purchaser either for condition, quantity, or quality after delivery is taken. Original packages of either fruit or vegetables, the contents of which may in part prove unsound, unwholesome, or unfit for the food of man, whether from delay in transit or any other cause, are sold on the express condition that the purchasers sort the said contents and destroy the unsound, unwholesome, or unfit portion before offering to the public."

These notices enable the wholesaler to contract out of an Act of Parliament.

Conclusion.

It is contended that the wholesaler should be responsible for ascertaining the condition of the goods he sold, and that if he sells unsound food he ought to be liable for prosecution and that no notice that he might put up should relieve him from that liability. Under Section 47 of the Public Health (London) Act, 1891, a retailer is responsible for the condition of the food although he was personally ignorant of it, but a wholesaler can escape conviction by proving that he had no reason to believe the food was unsound; the wholesaler, therefore, is unjustly placed in a better position than the retailer. The recent conference[1] at Islington decided to ask for an amendment of the law doing away with the anomaly

[1] THE LANCET, July 29th, p. 254.

and to this end proposed that Section 47 should read as follows, the words in italics being an amendment to the section as it stands at present :—

If it appears to a justice that any animal or article which has been seized or is liable to be seized under this section is diseased, or unsound, or unwholesome, or unfit for the food of man, he shall condemn the same, and order it to be destroyed or so disposed of as to prevent it from being exposed for sale or used for the food of man; and the person to whom the same belongs or did belong at the time of sale or exposure for sale, or deposit for the purpose of sale or of preparation for sale, or in whose possession or on whose premises the same was found, shall be liable on summary conviction to a fine not exceeding £50 for every animal, or article, or if the article consists of fruit, vegetables, corn, bread or flour, for every parcel thereof so condemned, or at the discretion of the court, without the infliction of a fine, to imprisonment for a term of not more than six months with or without hard labour.

Where it is shown that any article liable to be seized under this section, and found in the possession of any persons was purchased by him from another person for the food of man, and when so purchased was in such a condition as to be liable to be seized and condemned under this section, the person who so sold the same shall be liable to the fine and imprisonment above mentioned, unless he proves that at the time he sold the said article he did not know, and had no reason to believe, that it was in such condition, *and had taken reasonable steps to ascertain that the article was not in such a condition as to be liable to be seized and condemned under this section.*

NOTES FROM INDIA.

(FROM OUR OWN CORRESPONDENT.)

Report for 1921 of the Chemical Examiner, Government of Madras.

Major Clive Newcomb, I.M.S., chemical examiner to the Government of Madras, has submitted a very brief report, but there is nevertheless a number of interesting points worth notice. The work of his department continues to increase, the total number of analyses of all sorts amounting to 3952 as compared with 3714 in 1920, and an average for the previous 16 years of 3577. No less than 224 human poisoning cases were examined, this being the highest number ever dealt with in a single year. Stain cases totalled 406, and the number of stain articles 1515, both of which numbers are also records. Of the 224 cases suspected to be human poisoning, poison was detected in 91. Major Newcomb points out in this connexion that "the percentage of detections has shown a more marked decrease than can be ascribed to errors in sampling in the last 16 years," and he infers that medical officers and magistrates, even in cases where there seems to have been ample cause for death apart from poison, sent the viscera for examination to remove any possible suspicion. Among the human cases in which poison was detected, mercury (23 cases) displaced arsenic (17 cases) as the most commonly found poison; opium came next (14 cases), and then aconite (11 cases). In one instance nitric acid was apparently used, having been poured into the victim's ear. The report naïvely remarks that in spite of the authority of *Hamlet* "this orifice is not recommended for the introduction of poison when a fatal result is desired." Among cases of animal poisoning, which showed a decrease in number as compared with previous years, thevitin, the active principle of yellow oleander, was the poison most commonly found (nine cases), arsenic being a close second (eight cases).

Of 406 stain cases investigated for blood, or semen, or both, with 1575 articles, detections were made in 75·3 per cent. of the cases, and 68·6 per cent. of articles; 1024 specimens of blood stains were sent to the Imperial Serologist, Calcutta, and of these, 886 were reported to be human blood alone. "It is a matter for regret that in most of these blood cases the details of the crime furnished are insufficient to allow us to discover in which cases these tests for blood, and especially those in which the blood is found to be partly or wholly non-human, are of great importance in deciding the case."

Under the heading of general analyses appears an interesting paragraph on chloroform. A large number of specimens from stores sent out to the Government of India were examined, but no specimen failed to conform to the tests prescribed in the B.P. In England, when fatal cases of chloroform poisoning occur, the coroners always investigate the details of administration and the qualification of the anæsthetist, and the quality of the chloroform is rarely questioned. "In India the reverse is the rule, and without exception the chloroform is immediately suspected and usually condemned." Attached to the report are various tables giving detailed figures of the work done, nature of poisons detected, places from which viscera were sent for examination, &c. The Government General Hospital obviously makes good use of the chemical examiner, as the list of samples is a lengthy one, including the names of a considerable number of drugs in addition to a large number of specimens of stomach washings and vomits. The report is full of medico-legal interest. The chemical examiner—however anxious he may be to carry out research work—obviously finds little time to devote to this branch of activity on account of the mass of routine examinations demanded from his department.

Medical Subordinates and their Transfer Expenses.

At every one of the five local district conferences held last year, strong expressions of opinion were heard regarding the refusal of the Government to bear the cost of transfers of medical subordinates when these were made in the interests of the medical department. That the cost should be debited to local boards was held to be indefensible, and the Government were pressed to reconsider their decision. A recent order announces that "the Government of Madras have waived the recovery from local bodies of the cost of transfers of medical subordinates under them by the Surgeon-General against or without consulting the wishes of the local bodies concerned. Such recovery in the past by the Government was a sore point with local bodies, who protested against it at the various group conferences, and made it the subject of interpellations and resolutions in the Legislative Council. Hereafter, the cost of transfers made at the initiative of the Government will be met by the Government."

Completion of District Health Officer Scheme.

In a recent order the Government of Madras have specified in detail the services on which the grant in aid of general resources to local boards should be spent, in connexion with the formation of district health boards, and the employment of district health staffs. In April, 1923, they will be in a position to supply every district with a trained health officer, and under Section 68 (1) of the Madras Local Boards Act, 1920, they accordingly direct that every district board shall include in its schedule of establishment, with effect from April 1st, 1923, a post of district health officer. It has been calculated that the average cost of a health officer, excluding conveyance and travelling allowances, will be Rs.7560 per annum. The Government will not demand any contribution from the district boards towards the pay and local allowances of these officers, but the total grant of Rs.17·28 lakhs hitherto given in aid of general resources will be reduced by Rs.1·74 lakhs, which is the average cost of maintaining the service of health officers. District boards will provide for travelling allowances of health officers at their service. Thus each local board will get about 90 per cent. of what it has been getting hitherto; instead of the other 10 per cent. it will have a self-contained health staff consisting of a qualified health officer, and eight or more trained sanitary inspectors, all paid for by the Government. In connexion with the control of epidemic disease, the Director of Public Health will retain the power of transferring any member of the health staff from one district to another, and in cases of grave emergency—e.g., local outbreak of infectious disease—he may direct the whole or a portion of the

health staff of adjoining districts to work temporarily at the seat of infection. By April, 1923, therefore, the whole Presidency will be provided with local health staffs, a fact which marks a great advance in the campaign against epidemic disease.

July 10th.

BUDAPEST.

(FROM OUR OWN CORRESPONDENT.)

English and American Students at Budapest.

THE summer vacation course at the University of Budapest (now called the Pazmány Peter Scientific University) was recently opened. The special feature of this course is that the lectures are delivered in English only. Preparations for the course were begun as late as May; its success is due to the friendly assistance of the University of Oxford, and especially to the propaganda of the Oxford University Appointments Committee. Thirty-four English and American students are attending the course, not more than 20 having been expected. The course will last till Sept. 10th, and includes four lecture days each week. The Ministers of Public Instruction and Foreign Affairs, the British Minister Plenipotentiary, and the American Ambassador attended the opening ceremony which was held in the great hall of the University. Students attending the courses are expected to pass a short examination after its termination; those who pass will receive a certificate to that effect. The committee responsible for the course have a limited number of Hungarian students—chiefly women—who are taking single subjects, whereas the Oxford students are attending the complete course.

Hungarian Psychiatry.

Hungarian psychiatrists are to hold a conference during October (the exact date to be fixed later) to discuss the subject of psychic manifestations—a subject which interests not only experts, but also the general public. The first national meeting of Hungarian alienists was held about 20 years ago; normal and pathological psychic manifestations were then discussed by medical men, psychologists, teachers of philosophy, and legal experts. The subjects of discussion at the forthcoming conference embrace all phases of psychiatry, including psychoanalysis. The organising committee is of the opinion that the events of the past eight years have occasioned so much psychic disturbance that strict scientific examination of the most characteristic cases will afford much material from which conclusions may be drawn for use in the direction of the "soul-life" of the community. They argue that the lay public uses expressions like "atavistic," "psychopathic," "psychoanalytical," &c., without knowing the finer distinctions of meaning embodied in such terms. It is intended to discuss these questions and their terminology on a broad basis; teachers, legal men, philosophers, and all who deal professionally with psychology will be invited to participate. The conference will be held in the premises of the Royal Medical Society. Lecturers will be allotted a maximum of 20 minutes, and each speaker in the discussions will be permitted five minutes only. Prof. Karoly Szladits will lecture on "The Conception of Limited Accountability from the Point of View of Private Right"; Prof. Paul Angyal will lecture on "Reformatory Education of Weak-minded Offenders of Puerile Age," which subject will also be dealt with by Drs. Ignátz and Làszlò Fischer; Prof. Làszlò Epstein, Dr. Rudolf Fabinyi, and Dr. Gustav Oláh (director of the State Asylum) will discuss political psychopathy from the psychiatric standpoint. This lecture, which will be delivered at a special scientific gathering, promises to be very interesting, as it will deal with the psychic factors of revolution and the different theories and conceptions of "mass movements." Prof. Joseph Rubes, judge at the High Court, will lecture on the same subject from the legal point of view.

Public Health Services.

ANNUAL REPORT FOR 1921 OF THE MEDICAL OFFICER OF HEALTH AND SCHOOL MEDICAL OFFICER, LONDON COUNTY COUNCIL.

Dr. W. H. Hamer's recently issued annual report for 1921, as medical officer of health and school medical officer to the London County Council, contains, as usual, a great deal of valuable and interesting material. It is clear from the significant references scattered through the report that the public health department has, in common with other administrative sections, felt the keen edge of the wind of economy during the year. The Census taken last year shows that the centrifugal movement of the population, which commenced some 20 or 30 years ago, still continues, and there has been in the past ten years a marked decrease in the population of central areas, in which dwellings have been replaced in large part by commercial premises. Under the section dealing with infectious diseases some particulars are given of the Council's arrangements for dealing with small-pox. Dr. Hamer refers to efficiency of the diagnosis arrangements, with the facilities afforded for expert consultation; in four cases in 1920 and 1921 in which these facilities were fully utilised not a single secondary case occurred.

Detailed reference is made to the extensive outbreak of scarlet fever which occurred in 1921. The outbreak involved 37,739 notified cases, as against 22,705 in 1920; this number has been exceeded only once in London—viz., in 1893—since notification became compulsory. Considerable space is allotted to a discussion of the relation of the incidence of the cases to the prevalence of fleas. Dr. Hamer refers to the fact that in each of the years 1909–21 the flea maximum antedated the scarlet fever maximum by from one to as many as 13 weeks. In reply to the criticism that on the flea hypothesis there should have been higher flea prevalences recorded in 1920 and 1921 than were actually observed, it is pointed out that the problem is not a simple one, and that other determining factors, such as the proportion of susceptible units in the population at the time, must also be taken into account. "The size of a fire does not depend upon the number of sparks which light it." Dr. Hamer calculates that at the commencement of the present major prevalence of scarlet fever in London in 1920, there were—on account merely of the low level of scarlet fever prevalence from 1916 to 1919—at least 15,000 more susceptible children in London than at the commencement of the preceding major prevalence of the disease in 1913. This is given as an illustration of the late Dr. A. Ransome's contention that a certain density of the population at susceptible ages is needed before a disease can spread with the vigour of an epidemic.

Under the heading of tuberculosis, it is noted that out of 3886 patients who received sanatorium treatment during 1921, some 50 per cent. of the early cases and 30 per cent. of the moderately advanced cases were either quiescent or else much improved on discharge; quiescence implying a lesion completely healed so far as can be told, and a sputum free from tubercle bacilli; while "much improvement" implies that the general health is good, the working capacity more or less restored, and the signs and symptoms of tuberculosis are materially diminished. The improvement and development of the Council's tuberculosis dispensary service was continued during the year, with the result that the congestion produced by prolonged observation in doubtful cases and by extensive treatment with drugs was reduced. Difficulties still exist, and of these the problem of the advanced case is particularly mentioned. On grounds of humanity and for precautionary purposes the tuberculosis officers find it necessary to visit frequently these patients and to watch their home conditions, so that these advanced cases take up a considerable amount

of time which could, in Dr. Hamer's view, be more effectively devoted to the essential work of the dispensary.

In the school medical service section of his report Dr. Hamer draws attention to the effect of existing economic conditions in the nutrition of the children attending elementary schools. It may be said in general that while there has been a lowering in the nutrition of London school-children as a whole, cases of distress have been adequately dealt with, so that there has even been a reduction in the percentage of children with subnormal nutrition. An interesting table is given of the distribution of intelligence of children in the special schools, comparing the chronological with the mental age of the child. At the earlier ages the children gained at the rate of nearly three-quarters of a year's intelligence per year. This rate subsequently slackens, and after the age of 13 the progress is very small. It is stated that the experience acquired from the working of the Mental Deficiency Act suggests that children whose ultimate mental age does not exceed 7 are practically incapable of being employed, while those with a mental age of 10 or over are fitted for an ordinary life, unless they happen also to be unstable in temperament. A large proportion of the cases reach their mental limit at the age of 14.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

Blackpool.

Dr. E. W. Rees-Jones, in his annual report for 1921, states that the population as ascertained by the Census was 99,640. The Registrar-General's estimate for 1921 after correction for visitors is 73,800. The birth-rate for 1921 was 15·61, the death-rate 12·4, the infant mortality-rate 66·8, the phthisis death-rate 0·76, and the cancer death-rate 1·7. Dr. Rees-Jones points out that the infant mortality-rate is the lowest ever recorded, but that 57 of the 77 infant deaths occurred during the first three months of life. He hopes before long to be able to report a rate of 50. The male and female deaths from pulmonary tuberculosis were the same in number. Dr. Rees-Jones complains that the cases are not notified early enough and the services of the tuberculosis officer are not sufficiently sought by practitioners. There is an improvement in the regularity of attendance at the venereal disease clinic, and the institution of evening clinics, one for males and one for females, has proved a great success. Out of 33 samples of milk coming from outside the borough examined for tubercle bacilli, 4 were found to be infected; and among the 620 stalls for milch cows inside the borough, 11 cases of generalised tuberculosis and 4 cases of tubercle of the udder were found. The analyst reported that of 113 samples of milk, 7 were dirty, 3 contained added water, and 14 were deficient in fat. Altogether a very unsatisfactory report as to the milk-supply. Dr. Rees-Jones tells us that the basement dwellings are one of the most unsatisfactory features in Blackpool, and need to be dealt with stringently when the housing shortage has been met. With regard to this shortage there is some improvement, but Dr. Rees-Jones thinks that even when the 371 houses which remain to be completed are erected there will still be too few unless private enterprise steps in. The hours of bright sunshine in Blackpool last year were 1660.

Margate.

Dr. Rowan McCombe states that the population for 1921 was 27,740, the birth-rate 16·5, the death-rate 11·07, and the infant mortality-rate 69·7. Dr. McCombe tells us that 1921 was a healthy year, and that considering the dry season it was fortunate to have so little illness and deaths among the babies. Table XV., however, shows us that the diarrhœa death-rate in Margate was higher than that for England and Wales. The fever hospital is provided conjointly by the Margate, Ramsgate, Broadstairs, and Isle of Thanet rural authorities. Dr. McCombe points out that a resident medical superintendent is required, and also that he and his colleagues are agreed that the hospital should be enlarged without delay, isolation of all cases of diphtheria and scarlet fever being specially necessary for holiday resorts. Of the three midwives practising in the borough, two are municipal. The salary of these is paid by the town council and the fees received from patients are paid into the borough fund. They occupy their spare time in antenatal visiting. The total hours of sunshine registered during the year was 1800, an increase of 278 hours on 1920.

Hove.

Dr. A. Griffith gives the estimated population for 1921 as 44,150; the birth-rate was 13·36, the death-rate 13·79, the infant mortality-rate 66, and the diarrhœa-rate under 2 years 10·1. Most of the midwifery is undertaken by the staff of the Brighton Women's Hospital, and the municipal antenatal clinic was closed in August owing to the extended work of the Women's Hospital in this direction. The provision of home helps, the need for which arose during the war, has been discontinued as no longer necessary. The opening of the county council's new sanatorium in June has improved the provision for tuberculosis and the admission of male cases of tuberculosis to a block at the Hove Borough Sanatorium has ceased. Dr. Griffith tells us that the most important matter affecting the public health is the want of housing accommodation and consequent overcrowding, which affects not only the health, but the morals of the people. The 33 houses and flats erected under the council's housing scheme and opened in December have provided only a small fraction of what is required; there are still 180 applicants for the 30 houses now being erected, most of whom are willing to pay a reasonable rent.

Stafford.

Dr. Cyril Banks (now medical officer of health of Halifax), in his last annual report for Stafford, gives the estimated population for 1921 as 29,080. The birth-rate was 20·4, the death-rate 11·1, the death-rate from pulmonary tuberculosis 1·03; and the infant mortality-rate 73·9. The town water-supply has been extended to the borough boundary at Doxey, so that it is now no longer necessary for the inhabitants of that district to drink impure well-water. There are 3738 ordinary water-closets and 2364 waste-water closets in the borough, and Dr. Banks reports that the waste-water closets still continue to give a great deal of trouble owing to stoppages. The work of the infant welfare centre has increased and has received valuable support from the Guild of Social Welfare. The number of new houses erected during the year was 96, 92 of which form part of the municipal housing scheme.

SCHOOL MEDICAL SERVICE.

Gloucestershire.

Here 20,173 children were examined altogether, including 12,815 routine and 6298 special examinations. Routine examination revealed 55 per cent. of the children as normal—i.e., with no defect requiring notice. Gross defects of teeth appeared to be less common than in the early days of inspection. This is as it should be. The number of school closures, 66, appears high, but was the lowest on record. Whooping-cough accounted for 30 closures, and coughs and colds for 3. The number of cases of measles was small, only 87, which explains the two closures under this heading. The number of cases of ringworm, impetigo, and scabies during 1921 was smaller, but the average loss of attendance was considerably higher than in the previous year. The amount of pediculosis was less than last year, 22·8 per cent. of girls being infected and 5·45 per cent. of boys, making a total of 13·9 per cent. The scheme for treatment outlined in Dr. J. Middleton Martin's previous report is now in full working order. The essential basis of the scheme is that advantage shall be taken of facilities for treatment available in all parts of a county area through

local practitioners. This excellent idea will gradually be extended. Further provision is required for mentally defective children. There appear to be only 13 children recorded as blind or partially blind. Provision has been made for 11 of these to attend blind schools. The number of children requiring observation for malnutrition was 1949 discovered during routine examination and 274 special cases. There were, in addition, 77 special cases of malnutrition requiring active treatment. Of 1413 cases referred for treatment for nose and throat troubles 1189 were treated, and of 973 cases with visual defect 738 received treatment. In addition to 142 mentally defective or epileptic children, 336 were found to be dull and backward. No special provision appears to be made for these at present.

West Bromwich.

Of 2249 children seen at routine inspection, 300 suffered from malnutrition and considerably more than half were referred for treatment, the bulk of these being dental cases. Dr. R. Woolsey Stocks expresses dissatisfaction with the dental work owing to the frequent changes of school dentists, of whom there have been three in two years. The proportion of treatment to defects found has therefore been low. The suggestion for opening sub-clinics at various schools to relieve the congestion at the central clinic, with the consequent loss of valuable school time, is a good one. Hospital treatment appears to be given partly at the expense of charity, the cases treated at the Ear and Nose Hospital averaging 7*s.* each, and at the Orthopædic Hospital less than £1 a head. Curative exercises are given for cases of spinal curvature, infantile paralysis, and mouth-breathing under the direction of the school medical officer. The District Nursing Association supplies school nurses here, and this system is said to be working well, the work of the nurses being of a high standard.

The Services.

ROYAL NAVAL MEDICAL SERVICES.

THE following appointments are announced: Surg. Comdrs. D. G. Fergusson to the *Curlew*, and H. A. Kellond-Knight to the *Pembroke* for R.N. Hospital, Chatham; Surg. Lt.-Comdr. H. E. Y. White to the *President*, and for three months' hospital course.

Royal Horse Guards: Surg. Lt.-Col. B. Pares retires on ret. pay on account of ill-health.

ROYAL ARMY MEDICAL CORPS.

Maj. and Bt. Lt.-Col. D. S. Skelton is restd. to the estabt.

Maj. W. L. Bennett, half-pay list, late R.A.M.C., is placed on ret. pay on account of ill-health.

The undermentioned Capts. to be Majs.: Bt. Maj. C. H. H. Harold, Eric L. Fyffe, Robert F. Bridges, T. J. Hallinan (and to remain secd.), H. G. Monteith (and to remain secd.), Bt. Maj. J. D. Bowie, C. H. Stringer, and J. K. Gaunt.

Capt. S. M. Hattersley relinquishes the temp. rank of Maj.

Capt. D. R. Hennessy retires, receiving a gratuity.

Temp. Capts. relinquishing their commns.: E. F. Bashford and H. A. Tillman (granted the rank of Maj.), and G. L. K. Finlay, J. G. F. Heal, and C. A. Harrison (retain the rank of Capt.)

Temp. Hon. Capt. W. M. Richards relinquishes his commn. and retains the hon. rank of Capt.

TERRITORIAL ARMY.

Maj. S. J. Fielding to be Lt.-Col., and to command 54th (E. Angl.) Field Amb.

Capt. A. T. Sloan (late R.F.A.) to be Lt., and relinquishes the rank of Capt.

Lt. T. D. Webster to be Capt.

Maj. J. J. E. Biggs and Capt. H. A. Lake resign their commns. and are granted the rank of Maj.

The following relinquish their commns.: Capts. P. S. Price and W. Stobie (granted the rank of Maj.), and Capt. H. P. Malcolm (retains the rank of Capt.).

The undermentioned having attained the age limit are retired, and retain their rank except where otherwise stated: Lt.-Cols. W. F. Somerville and R. M. West; Majs. J. Gray (granted the rank of Lt.-Col.), A. J. Riddett, F. R. Bremner, W. A. Burns, J. A. H. Aitken, and H. A. Leebody (Bt. Lt.-Col.) (granted the rank of Col.); Capts. W. W. Greer (granted the rank of Maj.), A. M. Watson, R. D. Moore (granted the rank of Maj.), J. B. McLean, T. M. Metcalfe, J. W. Thomson (granted the rank of Maj.), R. Watson, and W. McC. Wanklyn.

General Hospitals: Lt.-Col. G. N. Biggs resigns his commn. and retains the rank of Lt.-Col. Capt. C. P. Lapage relinquishes his commn. and is granted the rank of Maj.

Sanitary Companies: J. A. Bingham to be Lt.

Supernumerary for service with O.T.C.: Maj. C. F. Searle (late R.A.M.C.) to be Capt., with the local rank of Maj., for service with the Cambridge University O.T.C., and relinquishes the rank of Maj.

Hon. Capt. L. B. Maxwell (late Gen. List) to be Lt., for services with the Univ. of London O.T.C., and relinquishes the hon. rank of Capt.

INDIA AND THE INDIAN MEDICAL SERVICES.

Lt.-Col. G. Grafton Young has been appointed Surgeon to the Governor of Bombay; Lt.-Col. J. B. D. Hunter and Maj. H. R. B. Gibson have been posted for duty to the Foreign and Political Department, the former as Legation Surgeon, Nepal; and Maj. O. H. Barber, civil surgeon, on return from leave, has been posted to Mussoorie, vice Lt.-Col. R. F. Baird, transferred to Allahabad. Maj. G. G. Jolly has been appointed Assistant Director of Public Health, Burma; and Maj. H. W. Pierpoint has been posted as Residency Surgeon, Bushire. Lt.-Col. R. M. Carter has been appointed to act as First Physician, J. J. Hospital, Professor of Medicine and Clinical Medicine and Therapeutics, Grant Medical College, Bombay. Maj. E. W. C. Bradfield, O.B.E., third surgeon, Government General Hospital, and professor of medical jurisprudence, Medical College, Madras, will act as Professor of Surgery, Medical College, and First Surgeon, Government General Hospital, Madras, in relief of Lt.-Col. T. H. Symons, who is granted leave and also acts as Superintendent and Second Surgeon (with Port and Marine duties), Government General Hospital, Madras, during the absence on leave of Lt.-Col. W. R. J. Scroggie.

DEATHS IN THE SERVICES.

Col. JAMES FRANCIS SUPPLE, C.B., R.A.M.C., who died suddenly on August 8th at the age of 77, entered the army in 1867 and retired with the rank of Colonel in 1903, having been promoted to that rank in 1898. In the Ashanti War he was present at the relief of Coomassie, and served in the Afghan War of 1879-80, and with the Burmese Expedition 1886–87, when he was principal medical officer to the 6th Brigade. In the South African War he was principal medical officer at the base and on the lines of communication, his services gaining for him the C.B. Col. Supple, who was several times mentioned in despatches, was principal medical officer to the troops at the Durbar which was held at Delhi in 1902.

Capt. E. D. M. Heriot-Hill, R.A.M.C., and Capt. S. Arnott, R.A.M.C., have been granted the Royal licence and authority to wear the Insignia of the Fourth Class of the Order of the Nile, which Decoration was conferred upon them by His Highness the Sultan of Egypt, now the King of Egypt, in recognition of good services rendered by them during the operations against the Aliab Dinkas in the Mongalla Province.

INDEX TO "THE LANCET," VOL. I., 1922.

THE Index and Title-page to Vol. I., 1922. which was completed with the issue of June 24th, is now ready. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 1, Bedford-street, Strand, W.C. 2.

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"Audi alteram partem."

THE SALE OF MILK DEFICIENT IN FAT.

To the Editor of THE LANCET.

SIR,—I am directed to forward you the enclosed copy of a Report and resolution addressed to the Minister of Health by this Society in regard to Circular No. 325 recently issued by the Ministry.

The Report was submitted to the Society of Medical Officers of Health in annual provincial meeting assembled at Bournemouth on July 28th, when it was unanimously resolved :—

"That the Society of Medical Officers of Health do approve the above Report and that a copy be forwarded to the Minister of Health. The Society further express their regret that such a Circular should have been issued and trust that the Minister on reconsideration will withdraw it."

I am, Sir, yours faithfully,

G. S. ELLISTON,
Executive Secretary, Society of Medical Officers of Health.

1, Upper Montague-street, W.C., August 8th, 1922.

REPORT TO THE SOCIETY OF MEDICAL OFFICERS OF HEALTH OF THE SPECIAL COMMITTEE ON FOODS, SUBMITTED TO THE ANNUAL PROVINCIAL MEETING OF THE SOCIETY AT BOURNEMOUTH, JULY 28TH, 1922.

Your Committee have noted with some concern Circular No. 325 recently issued by the Ministry of Health.

This Circular suggests for reasons stated, that in cases of milk adulteration prosecutions should be instituted only where a series of tests have shown "repeated default."

The chief reason for this suggestion is that conditions may exist which cause an animal temporarily to yield milk below the official standard.

Your Committee agree that this may be a fact in occasional instances, but it is very rare that the *mixed* milk of a herd will be found below the low official standard.

Your Committee recognise no advantage in the Circular other than to the unscrupulous milk-seller, who will now find a means of enriching himself at the cost of the community with less risk of punishment than has hitherto been the case.

The honest trader is amply protected since local authorities are always willing to consider exceptional circumstances. If he still feels aggrieved after a decision, it should be noted that the standard with which a milk-seller is required to comply is only one of *presumption*. Provision exists whereby, in such instances as those enumerated in the Circular, the milk-seller may submit proof to the magistrate, in case of prosecution, that the circumstance is one arising from natural causes and not from wilful tampering with the milk.

Your Committee consider that a few instances of hardship to a trader should not result in a general rule, the application of which is certain to penalise the public in the attempt to avoid the exceptional milk-seller being occasionally exposed to some inconvenience.

Your Committee further are of opinion that the suggestions in the Circular, if given effect to, will be destructive of efficiency in the administration of the Food and Drugs Acts in relation to milk.

Certain of the effects of the Circular will be as follows :—

(*a*) Some unscrupulous dealers will take advantage of the concession and continue to extract fat from, or to add water to, milk until that series of tests which will show "repeated default" has been obtained.

(*b*) The probability of a positive series being obtained within a brief period will be decreased if the milk-seller ceases to adulterate for a time after a positive result has been obtained. Such intermittency will reduce the probability of default being detected ; or with the same intention such milk-seller might only reduce the quality of the milk on certain days with obvious effects on the value of the sampling.

(*c*) Informal sampling cannot always be carried out, and the question arises whether in the case of positive results being thus obtained they can be used in court as evidence of "repeated default."

(*d*) Milk is the most important food of infants, and of many invalids, and inferior milk may continue to be supplied with the knowledge of the local authority to certain persons to their serious detriment, that is during the time the series of tests to prove "repeated default" are being obtained.

(*e*) The Food and Drugs Acts were never intended to bear this generous trading concession, and if such applies to the milk-seller it ought to be held to apply to every other trade sample.

In conclusion, your Committee recommend the Society of Medical Officers of Health to communicate the above considerations to the Minister of Health, together with the request that on reconsideration the Minister may see fit to withdraw, or in some way modify, Circular No. 325.

ROUTINE PROPHYLAXIS IN OPHTHALMIA NEONATORUM.

To the Editor of THE LANCET.

SIR,—In your leading article of August 12th you point out the necessity of educating the medical profession as to the value of early treatment in ophthalmia neonatorum. Surely it is as important to teach the value of prophylactic treatment. I have talked to many ophthalmic surgeons, and they all agree as to the value of 2 per cent. $AgNO_3$ as a prophylactic. In 1912 I had a case due to streptococci, in which the mother had no vaginal discharge at all. Since that time I have taught students and have myself used $AgNO_3$ as a prophylactic in every case that has come under my care. To me it has always seemed extraordinary that this simple procedure has not been added to the rules of the Central Midwives Board.—I am, Sir, yours faithfully,

MALCOLM DONALDSON.

Harley-street, W., August 12th, 1922.

THIRST AND RECTAL SALINES.

To the Editor of THE LANCET.

SIR,—Mr. Edmund R. Boyd is quite under a misapprehension that I sacrificed hospital attendance for private research. If he had used any imagination he would know the two could not interfere with each other. I am quite aware that the administration of water instead of saline per rectum is taught and practised in one clinic—at least at Edinburgh Royal Infirmary, but "one swallow does not make a summer."—I am, Sir, yours faithfully,

DOREEN STRANGER, M.B., Ch.B.

Cheltenham, August 14th, 1922.

PARTIAL PNEUMOTHORAX.

To the Editor of THE LANCET.

SIR,—Your recent annotation (THE LANCET, June 3rd, p. 1108) which discussed the article by myself and Dr. D. Kramer concerning partial artificial pneumothorax, called my attention to a defect in the article which was due to the necessary brevity of a preliminary report. Our ideas as to the future of this method of treatment differ from those which the reviewer ascribed to us in the following points :—

1. The idea is not revolutionary, because many of the most experienced operators are already of the opinion that positive pressures and extreme collapse are unnecessary except in unusual cases, as hæmorrhage, &c.

2. The treatment can never replace a fairly complete pneumothorax in strictly unilateral cases, because of the greater amount of time and attention which it requires to maintain a small pneumothorax.

3. The number of cases so treated must be limited, because it should be used only by those skilled in the treatment of tuberculosis, and one man can not attend to many such cases, on account of the time and care which they require.

4. The method is a very beautiful addition to the treatment of such cases as are almost able to respond to the usual methods of treatment, but require some aid to start them on the road to recovery.

Although approached from entirely different points of view, the striking similarity of the conclusions reached by Dr. W. Parry Morgan and by us affords convincing evidence of the accuracy of the clinical observations of both. On all points where the two papers overlap there is no question as to the priority of Dr. Morgan.—I am, Sir, yours faithfully,

NATHAN BARLOW,
Surgeon (R.).

Treasury Dept., U.S. Public Health Service, July 29th, 1922.

CLINIC EXPERIENCE IN CONTRACEPTION.

To the Editor of THE LANCET.

SIR,—In THE LANCET of August 12th there appears a letter with this title from a non-medical woman, Mrs. Marie Stopes, D.Sc., Ph.D. She gives statistics drawn from 1000 cases dealt with at her Birth Control Clinic, 61, Marlborough-road, N. The women attending this clinic are examined and treated only by a nurse, unless the latter happens to think that they need the advice of a doctor, in which case they are referred to the consultant medical officer, Dr. Jane Lorimer Hawthorne, who does not attend the clinic at any regular times, and who sees only a very small fraction of the cases.

These data, therefore, are based for the most part on the experience of a nurse uncorroborated by medical evidence, and the conclusions are arrived at by a medically untrained woman. I venture to suggest that neither data nor conclusions have much scientific value. Dr. Marie Stopes, I am sure, is actuated by the highest motives, but her ignorance of medical matters has led her to advocate, in her books, at her clinic, and elsewhere, the use of the gold-pin pessary, which has been condemned by British medical men and women as indisputably dangerous, giving rise to sepsis and abortions.

I formerly used the type of pessary known as the small occlusive cap, for which such extravagant claims are made by Dr. Stopes, but found it impossible to adjust in a great many cases on account of abnormality of the cervix. (Dr. Stopes herself says, "Where the cervix is torn, proliferated, seriously injured, or abnormal in any other way this type of cap is not feasible.") Further, I learned that even where the cervix was normal, the majority of women found it impracticably difficult to adjust. Indeed, I know one medical woman, married and a mother, who has never been able to adjust it on her own normal cervix, in spite of her knowledge of anatomy. I still consider the small occlusive cap suitable for a minority of cases, but as the Dutch Mensinga pessary is almost universally applicable (being much easier for the patient to adjust, and not contra-indicated by deformity of the cervix) I now consider the latter greatly preferable.

Dr. Stopes says she sees "certain physiological objections" against its use, but quite neglects to mention what they are.

In conclusion, I would stress the necessity for medical research on the subject of contraception, in order that the methods at present known may be more widely subjected to a careful scientific observation, and that, if possible, other more perfect methods may be found.

I am, Sir, yours faithfully,

NORMAN HAIRE.

New Cavendish-street, W., August 12th, 1922.

To the Editor of THE LANCET.

SIR,—Dr. Marie Stopes states in THE LANCET of August 12th that she can "see certain physiological objections" to the use of the occlusive pessary recommended by me in "Safe Marriage"[1]—that she considers it merely the "next best thing" to the cap fitting over cervix. I am not a doctor of medicine (nor, of course, is Dr. Marie Stopes), but as an experienced official reporter I collected all available evidence and exhibits in London and elsewhere, and brought these before Sir William Arbuthnot Lane and other medical authorities. My book was written under their expert guidance. The objections to the cap pessary are well known in medical circles, and evidence is available to prove that they cannot always be fitted securely by individual women, and that they are apt to be dislodged during intercourse. Sometimes doctors (and often nurses) fit too large sizes of "Dutch" pessary—say 80 mm. or 85 mm., whereas 60 to 70 mm. or even smaller proves most suitable and serviceable, entailing no discomfort whatever to either party.

It is not merely a superficial acquaintance with popular contraceptives that is required, but a clear and deep understanding of the meaning of contraception. May I suggest, without offence, that Dr. Stopes's 1000 local adherents and 10,000 corresponding ones, recorded by fill-up-a-form methods, do not furnish "clinical experience." It is not "evidence" at all—except as to the popularity of birth control. Contraception is a branch of medicine and it must be studied and applied in the same way as any other branch of medicine—otherwise it deteriorates into quackery. "Science"—not "Christian Science"—must be applied to this problem if the general public is to obtain any real and lasting benefit.

I am, Sir, yours faithfully,

London, W., August 11th, 1922. ETTIE A. ROUT.

[1] "Safe Marriage." By Ettie A. Rout. With Preface by Sir William Arbuthnot Lane. Heinemann (Medical Books), Ltd. 3s. 6d. net.

Obituary.

ARTHUR MARMADUKE SHEILD, M.B., B.S. CAMB., F.R.C.S. ENG.,

CONSULTING SURGEON TO ST. GEORGE'S HOSPITAL, THE HOSPITAL FOR WOMEN AND CHILDREN, WATERLOO BRIDGE ROAD, AND TO THE HOSPITAL OF SS. JOHN AND ELIZABETH.

Arthur Marmaduke Sheild, who died on August 4th at the Island of Coll, was a well-known consulting surgeon in London, 15 years ago, when he was still a young man, and the story of his early retirement from practice was a genuine tragedy. He was an authority on the surgery of the breast; had made special study of conditions of the throat and nose where operative treatment was requisite; and he was a learned dermatologist. All this by the time he was 40. Then, owing to an illness contracted in the course of his professional duties, he was compelled to retire from active practice, although the war brought him back to the service of his country in an advisory capacity.

Marmaduke Sheild was the son of William Henry Sheild, of The Gilfach, Pembrokeshire, and was born at Landawke, Lougharne, Carmarthen, in 1858. After being educated privately, he proceeded to the medical school of St. George's Hospital. From that school he qualified in 1879 with the M.R.C.S. Eng. and the L.R.C.P. Lond., and after holding the usual house appointments, he went to Addenbrooke's Hospital, Cambridge, as resident. At the same time he became an undergraduate at Downing College. In 1883 he graduated M.B., B.S., and returning to St. George's Hospital as obstetric resident took the Fellowship of the Royal College of Surgeons of England in what of recent times must be a rather remarkable manner, for he passed the primary and final examinations in the same month. In 1886 he was elected assistant surgeon at the Westminster Hospital, but shortly transferred his services to Charing Cross Hospital, where he was appointed assistant surgeon and lecturer in practical surgery. At this school he also lectured on diseases of the throat and ear, and acquired the experience that led to a considerable practice in oto-laryngology. In 1893 he returned to his old hospital, being elected to the staff of St. George's Hospital, where he did 14 years of strenuous work as surgeon and teacher. He became full surgeon in 1900 and held the post for seven years when, in 1907, he had the appalling misfortune to contract a serious double infection when operating on an abdominal case. He was gravely ill for many months, and endured a long and cruel ordeal, which terminated with an enforced retirement from the active staff of St. George's Hospital in 1907, at the early age of 49. He spent the last 15 years of his life in Devonshire, greatly solaced by his studies as a field naturalist and his devotion to fishing.

Sheild was a practical and informing teacher, and also wrote some sound works on his special subjects. He was the author of a useful little guide to surgical

anatomy for students, and published his clinical lectures on Nasal Obstruction and its Treatment. He wrote a practical treatise on diseases of the ear, though he made no original departures along this line of work, while he contributed the section on Dislocations and Joint Injuries to Treves's System of Surgery, and wrote the article on Diseases of the Breast in Quain's Dictionary of Medicine, and articles on Diseases of the Nails and Tumours of Skin in the first edition of Allbutt's System of Medicine. His best-known work, however, was the clinical treatise on Diseases of the Breast, which he published in 1898. In this book Sheild ignored the pathological aspect of many of the morbid conditions occurring in the gland and kept the clinical view steadily in the forefront. The material on which the work was based was drawn from the four large institutions with which he had been personally connected at different times in his career, showing that the design to write the book was one of long standing; but the main part of the work is a study of all the cases of disease of the breast admitted into St. George's Hospital in the 30 years between 1865 and 1895. The whole endeavour in a large book was towards simplicity and practical advice, and the work was recognised upon its appearance as a readable and trustworthy treatise on diseases of the breast.

In public Sheild was a clear and humorous speaker, as those who have heard him at the medical societies will remember, while in private life he was a profoundly witty man. He was an admirable mimic, and is supposed not to have increased his chances of professional advancement by the exercise of this talent at the expense of his seniors; as raconteur and conversationalist he was unusually brilliant, and, unlike many with these gifts, he was a cause of good talk in others, for he stimulated reflection and helped the less ready man to make his points. It is no wonder, therefore, that Sheild with his sound and steady surgical repute and fascinating social gifts was a popular and noticeable man, so that the abrupt termination of his successful career was regarded as a tragedy.

Sir Humphry Rolleston, who was elected to the staff of St. George's Hospital on the same day, writes: "Sheild's was a complex personality and often, perhaps generally, a somewhat critical or even cynical attitude was assumed as a form of camouflage for his underlying kindly and rather sentimental nature. Thus it was that at different times his character seemed puzzling if not contradictory—at one time the hard-headed business man, at others verging on the hyperconscientious. Another side that might have remained unsuspected by those familiar only with his professional activities was his intense love of nature and of the country; it was thus that when attacked in comparatively early life with pulmonary tuberculosis he went to a remote Scottish village with the determination that if his time was up he would at any rate get some country life and fishing first. It is, perhaps, fortunate that his end came when presumably he was enjoying his favourite occupation in the distant Hebrides. Sheild was a most impressive teacher and irresistibly recalled Sir George Humphry's methods and manner of driving the essentials of surgical practice into students. He seemed indeed to have imbibed much from that great master under whom he had worked as house surgeon at Addenbrooke's Hospital, Cambridge. His popularity as a teacher was deservedly great, and had he not been obliged by illness to leave London his success in consulting practice, already assured and considerable, would have been an ample reward for his early struggles and persistent industry."

EDWARD HUGH EDWARDS STACK, M.B., B.CH. CAMB., F.R.C.S. ENG.,

OPHTHALMIC SURGEON TO THE BRISTOL ROYAL INFIRMARY.

THE death at the age of 55 of Mr. E. H. E. Stack removes one who was well known in Bristol and the West of England as an ophthalmic surgeon. He was born in County Tyrone in 1866, and was educated at Haileybury, Cambridge, and St. Bartholomew's Hospital. At the last-named he distinguished himself by winning the Brackenbury medical scholarship, and holding more resident appointments than anyone before or since. He was house physician to Dr. Gee, ophthalmic house surgeon, extern and intern midwifery assistant; and it is believed that he was nominated house surgeon to Mr. Langton, but did not hold office owing to a rule limiting the number of appointments tenable by one individual. This record serves to illustrate his ability, industry, and wide interest in all branches of medicine. In 1897 Stack went to Bristol as house physician to the Royal Infirmary after taking his F.R.C.S. diploma. In 1902 he became house surgeon, and in 1906 was elected assistant surgeon. In 1914 he became full surgeon, but on Dr. Ogilvy's death he decided to specialise in eye work and was appointed ophthalmic surgeon at the Royal Infirmary. Later he succeeded to a vacancy as surgeon to the Bristol Eye Hospital.

Stack was a brilliant clinician in any branch of medicine that he touched. He had learned from Gee the mental habit of brushing aside non-essentials, and like Gee too, he was quick to observe unusual features of disease in his patients and appraise their importance. Widely informed, Stack was not worried by the fact that individual cases did not conform to type. It was perhaps this characteristic in his teaching that students appreciated and carried away with them into their practices. In fact, he always aimed at teaching men to practise medicine rather than to pass examinations, and he did not allow them to forget that when they left hospital they would be treating sick people, not diseases. Until he devoted himself entirely to eye work he had been surgeon to the Bristol Orthopædic Hospital and Home for Crippled Children, for he was very fond of children as patients; in fact, his ingenuity in devising "test types" for children too young to read gave his consulting-room the quaintest appearance. It was full of toys and humorous pictures drawn to Snellen's scale.

During the war Mr. Stack did much admirable work as ophthalmic specialist to the 2nd Southern General Hospital in Bristol, and at No. 56 General Hospital in France. He was not a frequent contributor to medical literature, but among his papers were a careful description of one of the few cases of leontiasis ossea recorded in England, and (jointly with Dr. Carey Coombs) a good account of the ocular effects of mustard gas, both of which were published in the *Bristol Medico-Chirurgical Journal*. He was a good churchman and at the time of his death held office as churchwarden at St. Paul's Church, Clifton. He leaves a widow and four children.

RICHARD NEVILLE HART, M.D. CAMB.

Dr. Neville Hart, who died suddenly at his residence in Bournemouth on July 22nd, was a cadet of an old Norfolk family, whose father practised at Erith. He was educated at Norwich Grammar School, at Cambridge, where he achieved distinction, and later he studied in Paris and at Bonn. After obtaining his degrees, his first appointments were those of resident physician and resident surgeon to the West London Hospital, and senior resident physician to King's College Hospital. He was subsequently appointed registrar, and placed on the staff of the hospital. He also acted as assistant medical officer at the London County Asylum, Epsom. This appointment he relinquished about 1908, and took up his residence in Bournemouth, where he practised until his death. He was an indefatigable worker, studious and punctilious to a degree, with an extraordinary memory. For many years Dr. Hart was a member of the Bournemouth Town Council, and played an active part in public affairs. He was an expert chess player, and could play four visualised games simultaneously, usually winning three and drawing one. He was also no mean musician. His early death at the age of 43 years leaves a gap in a large circle of friends and patients.

Medical News.

THE WELSH NATIONAL SCHOOL OF MEDICINE AND KING EDWARD VII. HOSPITAL, CARDIFF.—Up to the autumn of 1921 medical teaching in this school had not been carried beyond the intermediate subjects of anatomy and physiology; then somewhat precipitately teaching in the final clinical subjects was embarked upon. Before the first session was over the school was faced by threatened refusal on the part of the Conjoint Examining Board of the Royal Colleges, and of the University of London, to recognise the facilities available as sufficient for students who desired to be admitted to their respective final examinations. The lack of facilities mainly concerned the medical beds at King Edward VII. Hospital, Cardiff, upon which the school is centred. At this institution there are only 53 medical beds for adults, allocated equally between two visiting physicians and the professor of the medical unit. Finally provisional recognition for 12 months has been granted on the understanding that the number of medical beds is raised to 80, of which 30 are to be allotted to the professor of medicine.

The position now is that the hospital, which is so far fortunate, owing to the efforts of the late Colonel Bruce Vaughan, that it possesses already built unopened wards, must extend its accommodation at a moment when even for maintaining the beds already in use its financial position is far from sound. Moreover, the accommodation for its present nursing staff is barely adequate; yet the staff must be increased when more wards are opened. Colonel Mackintosh has already advised the board of management on the difficulties facing them. These are the difficulties to be surmounted. The board, however, possesses in its chairman, Sir William Diamond, a man accustomed to dealing with difficult positions, and have determined, if humanly possible, to meet the requirements of the school and therewith the needs of the district served by the hospital. We learn that a promise has been obtained of an immediate grant from the Government of £6940, and that a scheme has been set on foot for ensuring an increased income from Cardiff docks.

The difficulties ahead are not concerned only with sufficiency for clinical teaching. The medical school is an integral part of the University of Wales by which it is financed. Anatomy needs more suitable premises; physiology more funds to develop the buildings it has; pharmacology and materia medica is without proper accommodation; pathology and bacteriology are too limited in laboratory accommodation; medicine and surgery are needing laboratory facilities. All available funds must be devoted to the immediate necessities for teaching; none is available for research work without which teaching on university standard cannot be long maintained.

MANCHESTER AND ITS M.O H.—It is stated that 25 applications have been received for the vacant medical officership of health for Manchester, at the revised salary of £1700 for two years, rising to £2000. The applications will be dealt with by a special subcommittee, while the final selection will be with the City Council.

DOWRA DISPENSARY DISTRICT: A QUESTION OF SALARY.—An Irish correspondent writes: An unpleasant situation has arisen out of the action of the Co. Cavan Health Board in regard to a vacancy which occurred recently in the Dowra dispensary district in that county. Formerly this district was in the Enniskillen union, and the salary of its medical officer was fixed by a scale agreed on between the Enniskillen guardians and their Poor-law medical officers, and approved by the Local Government Board. The district has since been separated from the Enniskillen union and came under the control of the Co. Cavan Health Board. To the ordinary man it would appear that the Board would consider itself bound by agreements entered into by its predecessor. Unfortunately, a vacancy having occurred in the Dowra district, the county board fixed a salary for the new appointment at a figure much lower than that agreed to by the Enniskillen guardians. The local medical profession regarded this action as a breach of faith, and intending candidates were put in possession of the facts. All of them withdrew with the exception of one lady, and she was appointed. An attempt is being made by some members of the Health Board to suggest that medical criticism of the appointment is due to the sex of the person elected. There is, of course, no truth in this. Members of the medical profession in Ireland, as elsewhere, hold that women doctors have the same privileges and responsibilities as men. This is the first occasion, so far as I know, in which a woman doctor has deliberately placed a lower value on her services than is acceptable to others in her profession.

WE regret to announce the death in London on August 14th of Dr. J. A. Mansell Moullin, in his 73rd year.

THE King has approved of the retention of the title of "Honourable" by Dr. C. F. Marks and Dr. W. F. Taylor, who have served as Members of the Legislative Council of the State of Queensland.

THE ORDER OF ST. JOHN OF JERUSALEM IN ENGLAND. Major J. R. Williams and Surg. Lieut.-Col. J. D. Lloyd have been promoted to Knights of Grace, and Major F. T. Rees has been appointed an Esquire in the Order of St. John of Jerusalem in England.

FRAUDS BY A "DENTAL CONSULTANT."—A man giving the name of Claude Calvert and describing himself as a "dental consultant," an unregistered person who was stated to be conducting dental business at two addresses in and near London, has been sent to prison for 12 months by Sir Chartres Biron. He obtained money fraudulently in sums varying from £100 to £700 at a time from victims whom he attracted by advertising for a secretary, and the police estimated that his booty derived from similar practices during four years amounted to not less than £4000. Persons who get into touch with advertisers who demand money before engaging them should be at once on their guard. A comparatively small fee to a solicitor would probably be well expended on such occasions.

EXPERIMENTS ON LIVING ANIMALS DURING 1921.—The return showing the number and nature of experiments carried out under licence during the year 1921 was recently issued. We learn that all licensees under the Act (1876) were restricted to the registered place or places specified on their licences, with the exception of those who were permitted to perform inoculation experiments in places other than "a registered place," with the object of studying outbreaks of disease in remote places, or in other exceptional circumstances. The total number of licensees during 1921 was 812, of whom 219 performed no experiments. In no case has a cutting operation more severe than a superficial venesection been allowed to be performed without anæsthetics, nor has a certificate dispensing with the use of anæsthetics been allowed in any experiment involving a serious operation. The returns show that 7359 experiments were performed by 12 licensees in the course of cancer investigations; the great majority of these consisted of inoculations into mice or exposure of animals to radiation. A large number of experiments were performed with a view to the preservation of public health. Thus, a sewage farm has been registered as a place where experiments on living animals may be performed, in order to test the character of the effluent by its effect on living fish. Twenty-nine licensees performed nearly 20,000 experiments for the preparation and testing of antitoxic sera and vaccines, and for the testing and standardising of drugs. The irregularities reported are few and in no case serious. For example, one licensee who held certificate B for certain experiments on rabbits performed an operation not specified in the certificate. It was evident from his explanation that he had erred unwittingly, and he was cautioned as to the necessity of precise indication, for purposes of certification, of the proceedings to be adopted.

THE CHOLERA EPIDEMIC IN RUSSIA.—Information contained in the latest periodical report of the League of Nations Health Section conflicts sharply with the optimistic view of the spread of cholera in Russia taken by the American Relief Administration (THE LANCET, August 5th, p. 306). According to information received from the Soviet Commissar for Public Health, Asiatic cholera has become very severe since the beginning of the year, especially in the Zaporozhe and Poltava provinces of the Ukraine, 25,000 cases having been reported during the first half of the present year. The situation in Odessa is particularly bad. Since the beginning of the summer the epidemic has spread from the towns to the country. The northern and eastern provinces, almost untouched until July, have now reported centres of infection. "It looks," the report states, "as though the epidemics were going to be far more severe this year than last." The case-mortality is high, amounting to nearly 50 per cent. The epidemic is spreading chiefly along the railway lines of the Ukraine and from Rostov on the Don to Vladikavkas and Baku. In the Crimea and the Ukraine anti-cholera vaccination has been made compulsory, but it is very far from being generally used. 950,000 soldiers of the Red Army have been vaccinated since June 1st. The movement of refugees towards Volhynia and Podolia threatens Galicia. Eleven new cases have been reported from Rovno in Poland. In Roumania cholera was reported from Bessarabia in the middle of July, rigorous measures of isolation being at once adopted. Finland alone has been completely free from cholera. The course of the epidemic justifies the anxiety expressed by Mr. H. A. L. Fisher (THE LANCET, July 29th, p. 245) at the League of Nations Council last month and the need for carrying out in full the programme of the Warsaw Conference.

WELSH BOARD OF HEALTH.—The Minister of Health has made the following appointments (unpaid): Captain Ernest Evans, M.P., to be a member of the National Health Insurance Joint Committee; Prof. Ewen J. Maclean, F.R.S. Edin., J.P., to be chairman of the Welsh Consultative Council.

PRESENTATION TO A MEDICAL MAN.—On June 26th at the University Convocation Hall, Bombay, Kahn Bahadur Dr. N. H. Choksy, F.R.C.P. Bombay, was presented with an address, enclosed in a silver casket, by the President of the Medical Union, Dr. D. M. Gagrat. The address referred to Dr. Choksy's services to the city extending over 34 years, quoting words of the late Viscount Sandhurst when Governor of Bombay, "Your courage, zeal, energy beyond all praise and rare devotion to duty in dealing with a strange and unknown disease."

THE LATE DR. T. J. P. JENKINS.—Thomas John Price Jenkins, who died at his residence in London on August 6th at the age of 68, was the son of the late rector of Llanllwch, and received his medical education at Cambridge University and at St. Bartholomew's Hospital, qualifying M.R.C.S., L.R.C.P. Lond. in 1893. During the war he took an active interest in the formation of the London Welsh Battalion, of which he was medical officer, and he was also civil medical officer to the Recruiting Army Staff. He was ambulance lecturer for the London County Council, the East London Technical College, and the Metropolitan Police Force. In athletic circles and in Welsh life in London Dr. Jenkins was a prominent figure, his geniality endearing him to all with whom he associated. Footballers will recall his securing the international cup for Wales in 1887, when he scored the only try of the match from the halfway line.

UNQUALIFIED PRACTICE.—A man was convicted at a London police court this week of practising as a medical man, and pretending to the possession of a medical qualification which he had not got. Further, he was charged with having obtained clothing and surgical and scientific instruments of no little value by the same pretence. The prosecution was undertaken by the Medical Defence Union, and on the charge of falsely pretending to be a medical practitioner the man was fined £20 with the alternative of three months' imprisonment, further sentence of imprisonment following upon the other charges. The case illustrated the necessity that all concerned with the employment of medical assistants should consult the Medical Register as to the claims of any applicant for employment. Here the unqualified man signed the form of a medical agent as L.R.C.P., and when a practitioner applied to the agent for a locum tenens the unqualified man was sent, the practitioner seeming to have concluded that the agent had made all the necessary inquiries.

THE VISIT OF M. PAUL STRAUSS.—On Thursday afternoon in last week the Government hospitality was exercised in a graceful manner, when Sir Alfred Mond, the Minister of Health, and Lord Crawford, the Minister of Public Works, acted as hosts towards the French Minister of Health. M. Strauss was in England to visit the children from the devastated areas to whom hospitality has been given by various sections of the community, noticeably by the municipalities of Manchester, Dover, Bromley, and Portsmouth. Sir Alfred Mond, who presided over luncheon at the Carlton Hotel, briefly assured M. Strauss of the pleasure which the British Government had in showing their deep concern at the sufferings which France, especially her young generation, have to undergo as a legacy of the war. In reply M. Strauss made a simple but forcible speech in acknowledgment of the services rendered to young France, especially commending the spirit of insight and sympathy which had stimulated the offer of hospitality to the children from the devastated areas. His words were deeply appreciated by a small audience, which included many of the official leaders of the medical profession as well as representatives of the municipalities acting as hosts to the French children.

Appointments.

BROSTER, L. R., D.M., M.Ch. Oxf., F.R.C.S. Eng., has been appointed Assistant Surgeon to the Queen's Hospital for Children, Hackney-road, London.

LILLEY, E. L., M.B., B.S. Lond., F.R.C.S. Eng., one of the Medical Referees under the Workmen's Compensation Act for County Court Circuit No. 20.

WILSON, A. J., M.B., Ch.B. Edin., House Physician and Surgical Casualty Officer, Coventry and Warwickshire Hospital.

Royal Eye and Ear Hospital, Bradford: MCCULLOCH, J. D., M.B., Ch.B. Glasg., Hon. Ophthalmic Surgeon; WATSON D., M.B., Ch.B. Edin., F.R.C.S. Eng., Hon. Aural Surgeon.

Surgeons under the Factory and Workshop Acts: PARKER, R. P., L.R.C.P. & S. Edin., L.R.F.P.S. Glasg. (Royton); ASTLEY-WESTON, B. A., M.B., Ch.B. Bristol (Glastonbury).

Vacancies.

For further information refer to the advertisement columns.

Aylesbury, Royal Bucks Hospital.—Res. M.O. £200.
Birkenhead Borough Hospital.—Jun. H.S. £200.
Birkenhead County Borough.—Asst. M.O. £650.
Birmingham General Hospital.—H.S., Obstet. H.S., and Anæsth. Each £100. Also H.S. to Special Depts. £125.
Birmingham and Midland Ear and Throat Hospital.—Jun. H.S. £200.
Bristol General Hospital.—H.P.'s. H.S. Cas. H.S. Obstet. O. Each £150.
Cannock Chase, Hednesford, Staffs, Ministry of Pensions Hospital.—Jun. M.O. £350.
Canterbury, Kent and Canterbury Hospital.—Hon. Bact. and Path.
Cardiff, King Edward VII. Hospital.—Ophth. H.S. £150.
Central London Throat, Nose, and Ear Hospital, Gray's Inn-road, W.C.—H.S. £75. Registrar and Clin. Assts.
City of London Maternity Hospital, City-road, E.C.—Res. M.O. £100.
Doncaster Royal Infirmary and Dispensary.—Gen. Sec. £350.
Dreadnought Hospital, Greenwich.—H.P. £150.
Dumfries, Crichton Royal.—Jun. A.P. £350.
Guildford, Royal Surrey County Hospital.—H.S. £150.
Halifax Royal Infirmary.—Second and Third H.S.'s. £250 and £175 respectively.
Kesteven County Asylum, Sleaford, Lincs.—Med. Supt. £800.
Leeds General Infirmary.—Res. M.O. £200. Res. M.O. at Ida and Robert Arthington Hospital. £60. Also Ophth. and Aural H.S. £50.
Leicester City Education Committee.—Asst. Sch. M.O. £500.
Liverpool, Royal Southern Hospital.—Two H.P.'s and Three H.S.'s. Each £100. Res. Cas. O. £150. Also Pathologist.
Macclesfield, Cheshire County Mental Hospital.—Locum Tenens Asst. M.O. 7 guineas weekly.
Manchester, Barnes Convalescent Hospital, Cheadle.—Res. M.O. £300.
Manchester, Monsall Fever Hospital.—Third Asst. M.O. £250.
Manchester Royal Infirmary.—Asst. Director of Clin. Laby. £350.
Manchester, St. Mary's Hospitals for Women and Children.—Res. Obstet. S. £250.
Newcastle-upon-Tyne, Durham College of Medicine and the Royal Victoria Infirmary.—Jun. Asst. £400.
Newcastle-upon-Tyne, University of Durham College of Medicine.—Sen. Demonstrator of Anatomy. £600 to £700.
Nottingham General Dispensary.—Res. S. £300.
Perth, Murray Royal Asylum.—Asst. P. £350.
Public Dispensary, Drury Lane, W.C.—Res. M.O. £105.
Putney Hospital (Chester Bequest) Lower Common, S.W.—Res. M.O. £150.
Queen Mary's Hospital for East End, Stratford, E.—H.S. £150.
Rotherham Hospital.—Jun. H.S. £150.
St. Mary's Hospital, Paddington, W.—Med. Supt. £350.
St. Peter's Hospital for Stone, Henrietta-street, Covent Garden, W.C.—H.S. £75.
Warwick, King Edward VII. Memorial Sanatorium, Hertford Hill.—Med. Supt. £700.
West Bromwich County Borough.—First and Second Asst. M.O.H., &c. £700 and £500 respectively.
West End Hospital for Nervous Diseases, Regent's Park, N.W.—H.P. £100. Also Clin. Assts.
West London Hospital, Hammersmith-road, W.—H.P. and Two H.S.'s. Each £100. Non-res. Cas O. 5 guineas weekly.
Winsley Sanatorium, near Bath.—Asst. Res. M.O. £250.

The Chief Inspector of Factories, Home Office, S.W., announces the following vacant appointment: Longtown (Cumberland).

Births, Marriages, and Deaths.

BIRTHS.

MOODIE.—On August 5th, at Windsor-terrace, Dundee, the wife of A. R. Moodie, M.D., F.R.C.S.E., of a son.

PENDERED.—On August 2nd, at Malta, the wife of Captain John Hawkes Pendered, M.C., R.A.M.C., of a daughter.

WHITESIDE.—On August 4th, at Fazeley, Tamworth, the wife of Dr. Whiteside, of a daughter.

MARRIAGES.

KNIGHT—KINGSFORD.—On July 26th, at Holy Trinity, Brompton, by the Rev. E. S. Merriman, Chaplain of Middlesex Hospital, and Prebendary Gough, Allan Osborne Knight, M.R.C.S., L.R.C.P., eldest son of A. Osborne Knight, M.R.C.S., and Mrs. Knight, of Auckland, N.Z., to Margaret Hypatia Kingsford, M.R.C.S., L.R.C.P., second daughter of the late Herbert Kingsford and Mrs. Kingsford, formerly of Lima, Peru.

THOMAS—BENNETT.—On August 10th, at St. Saviour's, Hampstead, William Stanley Russell Thomas, M.B. Camb., to Kathleen Maud, younger daughter of the late Raymond Christmas Bennett and Mrs. Bennett, Warrington House, Steele's-road, Hampstead, London.

DEATHS.

GAFF.—On August 4th, at Chesterfield-road, Ewell, Surrey, James D. Gaff, M.D., C.M. Glasg., aged 83 years.

THOMAS.—On August 7th, at Bristol-road, Birmingham, William Thomas, M.B. Lond., F.R.C.S., aged 82 years.

THORMAN.—On August 13th, at The Grey Cottage, Branksome Park, Bournemouth, William Henry Thorman, M.B.E., F.R.C.P., M.R.C.S., aged 52 years.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Mariages, and Deaths.

Notes, Short Comments, and Answers to Correspondents.

HEALTH, THE BUSINESS MAN'S CHIEF ASSET.[1]

BY SIR NAPIER BURNETT, K.B.E., M.D. GLASG.

HITHERTO we have been too prone to regard health merely as the negation or antitheses of disease, accepting it as part of the ordinary routine of daily life until attention is suddenly directed to its interruption by some indication of disease in either of its two forms—namely, functional disturbance or organic change. Then we realise for the first time that we have lost something that we formerly possessed, and gave little heed to. I want you to look at this matter of health from an entirely different standpoint and to realise that it is not merely the absence of disease, but is in itself a definite entity—*a positive state that can be preserved and maintained.*

Health has its symptoms just as much as disease, but we so frequently fail to recognise them, largely because of their *silent* nature, whereas those indicating disease are more insistent and arrest our attention in the form, it may be, of pain, or discomfort, or lack of energy. Health is the sum total result of delicate chemical changes taking place in the millions of individual cells that make up the human organism. The maintenance of this chemical adjustment, known in the gross as health, constitutes the great defence or resistance of the human body to the invasion of disease.

The development of the science of bacteriology has given results of inestimable value in revealing the cause of infectious diseases and has furnished most valuable remedies for treatment; but these fascinating results must not be allowed to obscure the other and even more important factor in the study of health—namely, the degree of resistance of the human organism to the invading germs. When we hear the statement that *health can be purchased*, we are to understand that the knowledge of how to maintain the chemical balance in the human body is available if we will but apply it. It is an underestimate to say that a third of the diseases from which people die to-day are preventable by making use of the knowledge that we already possess. The old proverb that "a man is as old as his arteries" requires to be brought up to date, and may now be expressed as *a man's arteries are as old as he cares to make them.*

The Health of the Business Man.

There are few more tragic experiences in the life of a doctor than that of being consulted by a business man, carrying heavy responsibilities and organising large industries, who has been suddenly pulled up by the refusal of the human machine to carry on its functions. Long neglected and abused, the chemical balance of health fails him, and when the medical adviser gives his decision that there must be three or six months' cessation from all work and that he can never again carry on at the old pace and live, the patient is aghast at the apparent harshness of the verdict. The tragedy need not have occurred had there been prudent observance of the ordinary laws of health, for only the minority of diseases occur as a bolt from the blue, the great majority are preceded by repeated warnings, but these warnings are ignored and treated merely as tiresome incidents.

Let me give some illustrations of such warnings:—

Insomnia.—The business man, in his worries over bad trade and strained finance, follows his routine of going to bed at the usual hour, but merely to lie awake for hours, going over the details of the day's work. Such mental activity deprives the brain and heart of that period of quiet so essential for the readjustment of the chemical balance and the restoration from the wear and tear of the previous day. The sleeplessness continues for nights and weeks, and some "dope" is sought as a remedy—the real issue, removal of the cause, being avoided. Such symptoms of disturbed health all have a definite causation.

Insomnia should be regarded as a warning that the brain is being supplied with an excess of toxin from its own overwork, or toxins supplied from some other source, and the warning should be correctly interpreted; a week's cessation from business and congenial exercise in the open air will frequently restore the balance, but more necessary still it is to have the guidance and direction of the health adviser. My plea is that the business man will not postpone seeking advice until a more serious condition has developed, but will consult the doctor early, not as a physician in disease, but as an adviser in health.

Dyspepsia.—This is a very common complaint amongst business men. One of the interesting developments of modern business life is the widespread habit of utilising the lunch hour as a time for transacting a piece of business which has been crowded out of the ordinary hours of the office. "Come and have lunch and let us discuss this matter more fully" is a phrase, I suggest, that is not unknown to many of my audience. The intrusion of business worries into the meal hour exercises a most sinister influence on the digestive processes, with the result that dyspepsia is soon complained of, and from that results not merely injury to the digestive organs, but also the development of toxins or poisons that disturb the chemical balance of the general system.

Shortness of Breath.—This warning is often treated very lightly, especially by the business man over forty years of age. This symptom may result from a variety of different causes, some slight and others serious. For instance, it may be the first indication of chronic kidney mischief, or it may be, on the other hand, merely the result of a too rapid accumulation of adipose tissue owing to the neglect of regular exercise.

Individual Health Limitations.—Man still retains to some degree the imitative faculty so pronounced in his early ancestors, and to-day it is not without interest to see how one individual moulds his habits according to those of his neighbours, without consideration as to whether such habits are conductive to his own individual health or not. A man sees his friend enjoying the pleasures of a certain form of physical exercise, and he seeks to follow the example, with the result that he injures his health because that form of exercise is entirely beyond his individual health limitations. Or again, two brothers, both in perfect health, attend a public dinner and partake of the same foodstuffs and the same quantity of alcohol. Next day one feels perfectly fit and full of energy, whereas the other feels miserable, headachy and depressed. The same result follows each time this man touches alcohol in any form. The interpretation is that one brother is prohibited by the nature of his individual chemical balance from taking alcohol, whereas the other's individual chemistry appears to be unaffected by alcohol. Each individual, therefore, has to ascertain and study his own health limitations.

Value of Periodic Medical Examination.

In touching on these illustrations of interference with the chemical balance of health, my main object is to put before you a practical proposition—namely, a plea for the value of periodic medical examination. The doctrine that we have to wait until we are the subject of some disease before we consult a doctor is altogether out of date and obviously foolish. A systematic medical examination, say, once a year, should be the regular routine of business men. Such an examination should be a great mental asset, and is the surest way of detecting disease in its early and curable stage. *To recognise your medical man as your adviser in health as well as your physician in disease is a commercial proposition well worthy of consideration.* The wise engineer does not drive his machinery constantly until a breakdown disorganises his whole plant; he institutes periodic surveys with the object of detecting the early evidences of wear and maladjustment. Why do we persist in treating differently the greatest machine of all—the human machine?

Annual Stocktaking of Health: An Experiment.

In this connexion an interesting experiment has recently been carried out by an insurance company in America. The company during the years 1914 to 1920 granted a periodic complete physical examination, free of cost, to some 6000 of its policy-holders. The exact period was five-and-a-half years per person. The medical director of the company studied the after-history of these individuals and found (here I quote from the report) that "up to the end of the observation period there actually occurred 217 deaths among the examined 6000 persons. There should have been a total of 303 deaths if the mortality expected from persons of this class had actually occurred." There was a saving, therefore, of 28 per cent. in the mortality over a period of five years. This result was confirmed by independent investigation, and the monetary value of the saving in mortality was calculated to be in excess of $126,000. From this amount must be abstracted the cost of the original and subsequent examinations made for this group of 6000 policy-holders. The cost was approximately $40,000. It would appear, therefore, that the company, on this particular group of policy-holders, had its principal returned and made a gain of about 200 per cent. on its investment during a period of approximately five years.

This, however, was not the outstanding feature of the experiment. The important point to remember is that there has been a saving of life corresponding to 28 per cent. of the expected mortality in the short period of five years. It was to demonstrate the life-saving possibilities of such health work that this activity was begun. It has been

[1] An abstract of an address recently delivered to the London Rotary Club.

established to the satisfaction of this company that periodic medical examination is justified by the result in added life expectancy to the policy-holders examined.

The Business Man's Concern in the Health of His Employees.

There are three aspects of this subject that call for reference, namely :—

(*a*) *The Legislative or Compulsory Aspect.*—Modern legislation in the form of the Employers' Liability Act, the Workmen's Compensation Acts, &c., has brought a new factor into the business world, directed towards the protection of the interests of the employee. The employer, in order to meet certain risks, covers himself by insurance, and the tariff rates for such insurance are based on actuarial calculations of the average claims paid. Such legislation constitutes a very wise provision in the protection of the interests of the worker. More recently, additional legislation in the form of the employers' contributions under the National Health Insurance Acts has placed a further tax on industry.

(*b*) *Voluntary Effort.*—The pressure of work in factories and workshops during the war gave a great impetus to the establishment by employers of labour to what are known as "Welfare Schemes." One has been surprised and greatly impressed in finding how numerous and varied these schemes are throughout the country. So far as I can ascertain, there is no complete directory or list of such schemes available to the student of social welfare. The facilities referred to include swimming baths, recreation fields, reading rooms, gymnasia, sports clubs, model cottages, model gardens, &c. These schemes are financed in whole or in part by the employer, and their cumulative tendency must be to exercise a considerable influence on the health of the worker, not only in the form of healthy physical exercise, but also as a means of hygienic instruction.

(*c*) *The Health of the Worker—an Important Factor in Production.*—This aspect, for which I specially ask the attention of the business men, has an importance both humanitarian and economic. Let me illustrate : A contractor has undertaken a piece of work, and through his manager or foreman he engages workmen to carry out his plans. The worker is engaged on his general appearance, and it may be occasionally by reference to the nature of his former job ; the engagement is on the basis of "piece" or "time." The work proceeds satisfactorily for weeks and perhaps months ; then the foreman may have occasion to complain of some worker appearing to "slack," and the man is reprimanded and, it may be, ultimately dismissed. This "slacking" is not infrequently due to defective physical health—to a demand on the worker's strength that is beyond his individual health limitations. The worker struggles on, so as not to appear different from his fellows, but by the middle of the afternoon he is physically unfit for the work expected of him, and the work that he thereafter persists in is in all probability of an inferior quality. It is interesting to contemplate the number of shop and factory accidents that occur as the result of the overstrained physical condition of some individual worker. The latter, when he was engaged by the foreman, may have been the subject, say, of hernia or gross hæmorrhoids, or was perhaps in the early stages of tuberculosis of the lung ; so long as the employer of labour relies on the present crude methods of engaging his employees, so long will he be liable to suffer from not only diminished and defective output, but also to heavy claims for workmen's compensation.

My suggestion is that, in the interest of employer and employee alike, the worker should be engaged on the certificate of the medical officer of the works. The initial medical examination would decide whether the man had the physical capacity for the job to be undertaken ; it would also be the means of detecting the early signs of disease, when such disease is at a curable stage. The interests of the employers would be served by the knowledge that he was employing healthy men, and, further, that he was not jeopardising the health of any one of his employees. I am cognisant of the recent views that have been put forward in the form of psychological studies applied to industry, such as the development of "rhythm" in the work of the shop, &c., but in suggesting to the employer the adoption of systematic medical examination of the worker I merely plead the economic doctrine of making better use of the knowledge that we now possess.

RURAL CHILD WELFARE.

AN interesting account[1] of rural life in West Virginia, with a consideration of the causes of certain adverse conditions, with suggestions for their remedy, is included in a recent book on rural child welfare. The exposition of the principles involved in giving children the best chance is so helpful that all social and health workers may read it with benefit. Attention is drawn to the unattractive surroundings of many country homes, and the necessity for increasing their recreations and interests. Child labour, which is regarded as a factor in causing premature senility, is condemned : children's work, however, under proper conditions, is encouraged and directed into healthy channels by means of boys' and girls' clubs. These clubs, which have been in existence for ten years, centre round the schools, and have achieved much success, the success depending largely on the visiting agent or director. Some of the conditions described are almost impossible in a more densely populated country, like our own : the difficulty in enforcing education in Virginia lies not in the absence of schools, which seem to be within the reach of everyone, but in the fact that the school attendance officers are not so effective as in this country. We gather also that the teachers would compare unfavourably with ours.

In a chapter on Rural Child Dependency, Neglect, and Delinquency there will be found much useful information. For instance, in regard to illegitimate children, "unmarried neighbours are fathers of 11 per cent., married men of 13 per cent., and blood relations of 10 per cent." It is often difficult for the mothers of these children to get help at the courts or elsewhere : officials and others sometimes insist on placing the children out in such a way as to separate them from their mothers, a proceeding which can only be condemned. Both this problem and delinquency are shown to be largely due to lack of protection, neglect, and absence of wholesome recreation. For delinquency the writer urges the juvenile court and probation, but draws attention to the necessity of the probation officer being well qualified. The advantage of a medical and psychological examination in special cases does not seem to have been realised. The compilers of this book—for it is a compilation—are full of human sympathy and understanding and have much to say of value to all social workers.

[1] An Inquiry by the National Child Labor Committee, Based upon Conditions in West Virginia, under the Direction of Edward N. Clopper, Ph.D. New York : The Macmillan Company. 1922. Pp. 355. 14*s*.

DOMESTIC SMOKE.

IN his annual report for 1921 on the health of Bethnal Green, Dr. G. E. Oates tells us that 85 observations of smoke shafts were made, and in nine cases black smoke was observed in such quantity as to be a nuisance. Five intimation notices and two statutory notices were served. That will not help much to make the sky bright, because, as he adds, it is the private dwelling-houses in countless numbers which are responsible for the unhealthy soot-laden condition of the London atmosphere, and at present no legal steps can be taken to prevent this serious nuisance. There is a clause in the Smoke Abatement Bill authorising local authorities to make provision for smokeless heating arrangements in buildings other than private dwelling-houses. But the Bill, having been read a second time in the House of Lords, stood over until the autumn, after a remark from Lord Newton, chairman of the Smoke Abatement Committee, that it was hardly a genuine fulfilment of the promise made to those interested in smoke abatement. Some local authorities have on their own initiative been introducing smokeless methods in their new housing schemes ; 4025 Glasgow houses, finished or nearly finished, each have a gas-cooker and a gas wash-boiler along with the alternative of gas-heater and a coal-burning register grate in the living room. But Councillor William B. Smith, Glasgow's representative at the Conference of the Royal Sanitary Institute, still felt that an opportunity had been lost in not providing the houses with a modern form of coke boiler. Putting in a coal fire and leading a gas pipe to it is only perpetuating the difficulty of adapting old conditions to new. A valuable contribution towards the solution of the domestic smoke nuisance is the appearance of a book of 80 pages entitled "The Smokeless City" (Longmans, Green and Co. 1922. 1*s*. 6*d*.), by Mr. E. D. Simon, Lord Mayor of Manchester, and Miss Marion Fitzgerald. The frontispiece is one of the best things in the book, for it is a photograph taken in Manchester on June 23rd, 1922, showing how large a part the house chimney plays in polluting the atmosphere, even in summer time. Taking the country as a whole, the authors claim that the domestic chimney is responsible for three-quarters of the smoke and more than three-quarters of the damage done by smoke. Without pressing for entire smokelessness as a practical solution, the authors hold that in the standard house, where central heating is not available, the scullery should be provided with a gas-cooker and a coke fire-boiler, with a convertible grate in the living room and gas fires in the bedrooms. Universally adopted, this arrangement would reduce domestic smoke so much that it would hardly be a serious nuisance. The book, which has a preface by Lord Newton and an appendix on the comparative cost of household washing in Manchester and Harrogate, is attractively written and should help in the education of popular opinion between now and the adjourned discussion in Parliament of the Smoke Abatement Bill.